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Defining Platform Markets

CPI COMPETITION POLICY® INTERNATIONAL

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LETTER FROM THE EDITOR

Dear Readers,

Market definition is perhaps the fundamental step in any antitrust analysis. If competition rules are to seek to regulate markets, and markets (by definition) consist of consumers and suppliers, this should not come as any surprise.

However, market definition continues to raise perplexing issues for regulators, litigants, and courts alike. This is because markets constantly evolve, and their patterns of supply and demand may elude the tools that may have been developed decades before, in an entirely different context.

Traditional tools used to define markets were based on classical economics, in turn based on concepts such as supply and demand, which could easily be captured by reliance on price-sensitivity as a proxy to determine whether two sets of goods formed part of the same relevant market. However, this analysis is rendered more complex in today's markets, where, quite often, goods or services are offered free of charge at the point of consumption, with the supplier earning a margin through other activities, such as the associated supply of advertising (e.g. on a search or social media platform).

The articles in this Chronicle address the issues that parties face as the old tools are incrementally updated to account for modern market dynamics.

Jonathan M. Barnett opens by noting the widely held assumption that platform technology markets are particularly prone to monopoly outcomes due to network effects and switching costs. This assumption supports dramatic changes, both proposed and enacted, to the application of competition and antitrust law in platform markets. However, in his view this lacks empirical support. The historical development of technology markets shows that incumbent platforms have often been challenged successfully by innovative entrants

Nestor Duch-Brown & Wouter Vergote then build on this theme, noting that while advances in economic theory, econometrics, and data availability have helped antitrust authorities to fine-tune their approach to market definition in traditional brick and mortar markets, new insights have upended the applicability of the same tools in an online context. The article discusses several complexities laid bare by developments in the economics of digital platform markets: zero-price markets, personalized pricing, the single versus multi market approach to market definition, single-homing versus multi-homing, and non-generic complementarities in digital platform ecosystems.

Turning to more concrete matters, **Liliane Giardino-Karlinger & Rossitza Kotzeva** discuss the European Commission's review of its Market Definition Notice ("MDN"), which had remained unaltered since its adoption in 1997. Among the novelties in the revised "Draft MDN" as published in November 2022 is additional guidance in relation to market definition in digital markets, such as multi-sided markets, aftermarkets, and digital eco-systems. This guidance builds on the significant experience built in the last two decades both in the realm of merger control and in antitrust enforcement. The article critically assesses the guidance and places it in the vital context of recent litigation. On a similar contemporary theme, **Andreea Antuca, Gunnar Niels & Helen Ralston-Smith** discuss market definition as it relates to two-sided platforms. Drawing on the judgment of the UK Competition Appeal Tribunal in *BGL/Comparethemarket v. Competition and Markets Authority*, the article addresses some of the main questions relating to multi-sided market definition.

Rosa M. Abrantes-Metz & Albert D. Metz note how the U.S. Supreme Court's Amex decision introduced and strengthened a deal of economic jargon into the legal lexicon; including "multisided platforms," "transaction platforms," "indirect network effects" and "two-sided analysis." As the authors note, however, sometimes such colorful terms precede any precise, scientific definition. What, after all, is a "two-sided analysis?" For that matter, how – formulaically – are indirect network effects defined and measured? The authors explore some generally accepted concepts, how they relate to measures of market power, and how they support the calculation of at least one source of antitrust damages, the price overcharge.

Taking a continental European perspective, **Jens-Uwe Franck & Martin Peitz** discuss how the German antitrust authority has designated Alphabet, Meta, and Amazon as so-called "19a firms." As a result, they are potentially subject to specific competition law interventions under a special procedure. In these three designation decisions, market definition plays an important role. However, as the authors note, the authority's considerations were made at a somewhat aggregate level, potentially abstracting its decisionmaking from key differences across market segments.

Finally, **Jørgen Veisdal** returns to brass tacks. While the term "platform" is now ubiquitous in everyday language, its precise definition remains ambiguous. This is arguably for technical reasons (which are trivial to grasp), but seemingly difficult to communicate to the public at large. For example, do Microsoft's platforms warrant the same attention from regulators as Meta's or Alphabet's? Technically, what distinguishes one from the other; and what are the implications for policy makers?

In sum, the set of articles in this edition of the Chronicle constitute a valuable contribution to the ever-evolving debate on how to approach market definition in innovative, contemporary markets. Each brings unique insight from a particular perspective, which will of no doubt be of value to our readers.

As always, many thanks to our great panel of authors.

Sincerely,

CPI Team

SUMMARIES

SUMMARIES

WHAT'S NEXT?

For February 2023, we will feature an Antitrust Chronicle focused on issues related to (1) **Mergers as Monopolization**; and (2) **White Collar Defense**.

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The CPI Editorial Team will evaluate all submissions and will publish the best papers. Authors can submit papers on any topic related to competition and regulation, however, priority will be given to articles addressing the abovementioned topics. Co-authors are always welcome.

FRAGILE GIANTS: REASSESSING MARKET POWER IN PLATFORM ECOSYSTEMS

BY JONATHAN M. BARNETT[1]

1 The author is the Torrey H. Webb Professor of Law at the University of Southern California, Gould School of Law. This contribution is based on a working paper, *Illusions of Dominance?: Revisiting the Market Power Assumption in Platform Ecosystems* (Oct. 2022), https://www.ssrn.com/sol3/papers.cfm?abstract_id=4259260, which is part of a research project supported by the International Center for Law and Economics.

It has become conventional wisdom that incumbent platforms enjoy market power as a result of a combination of network effects and switching costs that lock in users and lock out competitors. This assumption has driven far-reaching changes in competition law and policy in the European Union, the People's Republic of China, and other significant jurisdictions. In the United States, this assumption underlies urgent calls by legislators, regulators, and some commentators for "reforms" that would shift U.S. antitrust law from a regime based primarily on the balancing analysis embodied in the rule of reason to a regime based substantially on rules of quasi-per se illegality concerning a wide array of business practices engaged in by market platforms. Some commentators, legislators, and regulators (including the current Chair of the Federal Trade Commission)[2] even analogize incumbent platforms to natural monopolies, which would suggest that these entities should be removed from the free play of competitive forces and placed inside a regulatory framework of continuous supervision.

Given the significant departure that these reforms, both enacted and proposed, represent relative to the surgical balancing-type analysis that has principally characterized antitrust enforcement in both the U.S. and Europe, it would be expected that the underlying market power assumption would rest on persuasive empirical grounds. In this contribution, I provide evidence strongly suggesting that is not the case.

Historical evidence on the rise and fall of incumbents in platform markets, and close examination of a platform market that stands at the heart of the digital economy, cloud-computing services, suggest that leading platforms often, if not typically, face substantial discipline from actual or potential competitors. Platform markets do tend to converge on a small number of providers—a good thing since scale is necessary to generate the cost-efficiencies that arise from technologies that efficiently intermediate between complementary user groups. However, over a reasonable period of time, even established platforms with large market shares have been repeatedly and successfully challenged by firms that offer lower-cost, higher-quality, or more innovative products. Given these tendencies over a broad range of markets and periods, it appears that the widely supported shift in competition law and policy may often rest on a theoretical construct, rather than empirical reality.

I. UNCONVENTIONAL LESSONS FROM PLATFORM HISTORY

Popular commentary, policy discussions, and scholarly analysis currently exhibit an inordinate focus on the purportedly unique competitive risks posed by incumbent platforms, also known as "Big Tech." Yet platform markets — defined broadly as markets in which a provider plays an intermediation function with respect to two or more complementary user populations — are nothing new. We can therefore use history to gain insight into the typical longevity of leading platforms. That exercise identifies multiple cases in which seemingly unbeatable incumbents were rapidly and unexpectedly toppled by a more innovative competitor. For example:

· eBay pioneered online shopping in the late 1990s using an auction model, but was overcome in the late 2000s by Amazon, which used an integrated distribution model.

· AOL dominated internet dial-up access service in the late 1990s (and, at its peak, acquired Time Warner for $165 billion in 2000), but failed to adapt to the shift to broadband internet access starting in the early 2000s.

· PalmPilot pioneered handheld communications in the late 1990s, but was overtaken in the early 2000s by cellphone technology commercialized by firms such as Nokia and Blackberry.

· Nokia and Blackberry dominated the worldwide cellphone market in the early to mid-2000s but were eclipsed by Apple once it introduced the iPhone in 2007.

Contrary to the narrative of perpetually entrenched monopolies that drives the current regulatory consensus, technology history presents an iterated sequence of repeated and successful challenges to market leaders by innovative entrants. (The exception that proves the rule is AT&T, which was sheltered for decades by a statutory monopoly.) Repeatedly, seemingly indomitable firms with large market shares, apparently unbeatable technology, and abundant capital and technical expertise, were unable to fend off competitive threats posed by a firm with a superior product or service, especially a product or service that rendered the incumbent's product obsolete. Entrepreneurial innovation, rather than regulatory intervention, has consistently disrupted concentrated markets.

To appreciate in more detail the surprising fragility of incumbent platforms, it is helpful to review the evolution of the social networking market. In the mid-2000s, some commentators characterized the market pioneer, MySpace, as an entrenched "natural monopoly." Apparently sharing a similar view, News Corporation purchased the platform for $580 million in 2005. Both commentators and Rupert Murdoch were soon

2 Lina M. Khan, *The End of Antitrust History Revisited*, 133 Harv. L. Rev. 1655, 1664 (2020) (stating that technology platforms "seem to exhibit natural monopoly features").

proved wrong. By 2008, MySpace had been overtaken by Facebook, which rapidly secured market leadership, and News Corporation sold MySpace for $35 million in 2011. In turn, Facebook is today widely characterized by regulators, commentators, and some scholars as a clear case of a monopoly—including in two pending lawsuits by the Federal Trade Commission—yet escalating user migration to a new challenger, TikTok, says otherwise. A decline of over two-thirds in the market value of Meta Platforms, Facebook's parent, in the 12-month period preceding December 27, 2022 is hard to reconcile with an allegedly secure monopoly that warrants antitrust intervention.

II. REVISITING THE PLATFORM MONOPOLY THESIS

For any rigorous practitioner of antitrust analysis, this apparent discrepancy between fact and theory necessitates revisiting whether conventional wisdom has been overly confident in its attribution of market power to incumbents in platform markets. In particular, it is important to clarify, and assess the strength of, the underlying assumptions that support the view that platform markets are inherently prone to converge on monopoly outcomes. These assumptions ultimately drive the view that regulators should act preemptively to protect competitive conditions rather than waiting for the market to inevitably fail.

There are several critical assumptions behind the currently prevailing regulatory paradigm. Only one of these assumptions is likely to be consistently satisfied in real-world platform environments.

A. Network Effects

First, it must be the case that the relevant market exhibits network effects—either directly among members of the same user population (for example, cellphone users) or indirectly through the interaction of complementary user populations mediated by the platform (for example, smartphone users and developers). This is generally the case in platform markets and explains why these markets tend to evolve toward a state of affairs in which most users use only a handful of leading platforms and, as a result, enjoy great efficiencies compared to unmediated transactions. Yet this fact by itself does not necessarily show that prevailing platforms are immune from competitive challenges.

B. Switching Costs

Second, it must be the case that platform users bear high switching costs (or relatedly, cannot easily use multiple platforms concurrently). This assumption is often not satisfied. For example, while it is difficult for existing users of MS Word to switch to Google Docs, it is not difficult at all for new users. It appears that younger users prefer not only Google Docs but often Google's G office productivity suite over MS Office, which has been losing significant market share. Similarly, users in the food-delivery service market commonly use more than one of the leading providers (DoorDash, Grubhub, and Uber Eats), while vendors similarly often use all leading platforms concurrently. In markets where users can easily switch to competing providers, or can use multiple providers concurrently, even substantial market shares are unlikely to translate into market power for the simple reason that users can "vote with their feet" (or clicks).

C. Homogenous Goods

Third, it must be the case that the relevant market is characterized by a homogenous (or more precisely, inherently homogenous) good or service. When this assumption is not satisfied, potential challengers can divert users from the incumbent platform by developing differentiated services that appeal to a significant subset of the user population. Again, examples are easy to find. In the general search market, Google dominates; however, other services lead in more specialized search markets — Zillow and Redfin in residential real estate, Expedia and Booking in travel, Yahoo! and Bloomberg in finance, and Amazon and Walmart (and now Pinduoduo's Temu shopping platform[3]) in general online shopping. Moreover, boundaries between platform market segments are often fluid. While DoorDash, Grubhub, and Uber Eats lead in food-delivery services, other firms are prominent in closely adjacent service markets, such as direct restaurant-to-consumer delivery (Domino's) or instant-delivery services (Instacart, Gopuff). If boundaries between market segments are permeable, then even an apparently dominant firm in a "core" platform market may anticipate competition from providers in adjacent markets, who can divert users away from the core market. Suggesting awareness of this threat, Google has invested substantial resources to enter adjacent shopping and travel search verticals (Google Shopping, Google Trips), although it has failed in both cases.

3 Shen Lu, *American Bargain Hunters Flock to a New Online Platform Forged in China*, Wall St. J., Dec. 24, 2022.

D. Summing Up

Closer examination shows that real-world markets often and perhaps typically do not conform substantially to the assumptions that underlie the prevailing regulatory paradigm. This is not to say that these assumptions are never substantially satisfied, in which case antitrust concerns concerning a *specific* platform would be warranted. The fundamental point is simply, as a matter of antitrust analysis and enforcement, there does not seem to be sufficient ground to believe that platform ecosystems in general are prone to converge toward market failure. If that is the case, there is little reason to depart from the fact-intensive, case-specific approach that regulators, and courts adjudicating antitrust claims, have historically pursued.

To gain further insight into these points, I examine the cloud-computing market, which has been characterized by regulators and some commentators as a market that raises antitrust concerns in light of the purportedly dominant positions held by leading providers. Closer scrutiny illustrates the erroneous conclusions to which regulators and commentators can be led when relying reflexively on the now-dominant paradigm of an entrenched platform monopoly, rather than engaging in fact-intensive inquiry into real-world market conditions.

III. IS THE CLOUD REALLY THE NEXT PLATFORM MONOPOLY?

Regulators in the U.S., EU, and UK have raised concerns about competitive conditions in the cloud-computing services market. Amazon's AWS, the market pioneer, is currently under investigation by US, European, and British competition regulators[4], Microsoft's practices in the cloud market have attracted scrutiny from European regulators[5], and the cloud businesses of Amazon, Microsoft, and Google are currently under investigation by the UK's Office of Communications.[6] The Majority Staff Report issued by the US House Judiciary Committee in 2020 warned ominously that Google was investing "heavily" in its cloud computing service, "positioning itself to dominate the 'internet of things.'[7] A report commissioned by CISPE, an organization that represents European cloud infrastructure providers, claimed in 2021 that leading cloud computing services were taking actions that "are already affecting the cloud computing market . . . threatening its contestability and distorting competition."[8]

These predictions of imminent market failure rely on two related observations. First, regulators and some commentators have expressed concern over the substantial market shares attributed to AWS, the market pioneer and largest cloud provider (and more recently Microsoft Azure), implicitly or explicitly inferring that high concentration levels indicate actual or potential market power. Second, regulators have expressed concern that users face high switching costs when moving from one cloud provider to another and therefore are "locked in" and exposed to anticompetitive practices by dominant providers. (In this discussion of the cloud ecosystem, "users" will generally refer to business users, rather than individual end-users.)

Several features of the cloud ecosystem not only cast doubt on these concerns but suggest that the ecosystem is generating far-reaching efficiency effects by lowering entry barriers, increasing user convenience, and delivering cost-savings to an impressively large population of business users and end-users across a broad range of industries. By implication, this suggests that regulatory intervention is not only unnecessary but would potentially impose significant social costs by distorting the market's organic development of efficient market structures for deploying cloud-enabled technologies. Contrary to the suggestions made by regulators and some commentators, it is empirically ungrounded antitrust intervention, rather than cloud providers' business practices, that threatens to "distort" competitive conditions.

IV. ARE CLOUD LEADERS REALLY DOMINANT?

Regulators' concerns have derived in part from the large revenue shares attributed to AWS, and more recently, Microsoft Azure, and Google Cloud ("GC"), the largest cloud service providers. It is not clear, however, that regulators have considered thoroughly the components of what is referred to as the "cloud services market." To evaluate whether the apparent concentration of revenues among AWS, Azure, and GC plausibly gives

4 Competition Markets Authority, *CMA investigates Amazon over suspected anti-competitive practices*, July 6, 2022; European Commission, *Antitrust: Commission opens investigation into possible anti-competitive conduct of Amazon*, July 17, 2019; David McLaughlin, Dina Bass, and Naomi Nix, *Amazon Cloud Unit Draws Antitrust Scrutiny from FTC's Khan*, Bloomberg, Dec. 22, 2021.

5 Paresh Dave, *Microsoft's cloud business targeted by EU antitrust regulators*, Reuters, Apr. 2, 2022.

6 Joe Hoppe & Sam Schechner, *Amazon, Microsoft, Google Face Cloud-Services Examination in U.K.*, Wall St. J., Sept. 22, 2022.

7 Majority Staff Report, Committee on the Judiciary, U.S. House of Representatives 37 (Oct. 2020).

8 Frédéric Jenny, Cloud Infrastructure Services: An analysis of potentially anti-competitive practices (Oct. 2021), https://cispe.cloud/studies/fairsoftware.

rise to antitrust concerns, it is necessary to distinguish among three principal segments of the cloud ecosystem. These include the infrastructure-as-a-service ("IaaS"), platform-as-a-service ("PaaS"), and software-as-a-service ("SaaS") segments. Firms (especially larger firms) can also assemble "private clouds," which are only used by a single entity, as an alternative to a "public cloud" service, which is used by thousands of entities, that is provided by entities such as AWS, Azure, and GC. Additionally, all firms may retain significant usage of on-premises systems for certain data storage functions or data pools. The critical point is that antitrust analysis that focuses on revenues sourced from one segment of the cloud ecosystem — namely, public cloud IaaS services — does not reflect users' full menu of service options and may therefore reach an unfounded inference of market power.

Even within the public cloud IaaS segment, the factual basis for attributing market power to leading providers is contestable. Based on data estimates from Gartner as of 2021, AWS held 39 percent, Azure held 21 percent, and GC held 7 percent of worldwide revenue share in the IaaS public cloud segment, trailed by Oracle, IBM, and other smaller providers.[9] None of these revenue shares approach the threshold that would normally give rise to antitrust concern. Moreover, the public cloud IaaS segment has become *more* competitive over time — precisely contrary to the standard model of platform entrenchment. Since 2015, AWS's revenue share has been stable, but Azure has gained a large and increasing share, and GC has secured a substantial although smaller share. If the public-cloud IaaS segment is broken down by user type, competitive conditions improve even further: based on survey evidence as of 2021, Azure had outmatched AWS among large-firm users of IaaS services in several regions and industries.[10]

These tendencies toward increased competition stand in contrast to the observation in the House Judiciary Committee's 2020 report that AWS "is the unquestioned leader in the cloud computing market."[11] Whether or not that statement was plausible in 2020, that is clearly not the case in 2022. Even if we focus only on the IaaS public-cloud segment, at least two well-resourced entrants, Azure and GC, have already challenged AWS's initial dominance and the IaaS segment is now evolving toward apparently intense competition among the largest providers. Additionally, Oracle and IBM, which are well-resourced competitors with deep technical expertise, are latecomer entrants that may exert competitive discipline. If we also take into account that users, especially large-entity users, can allocate some data-storage functions to private cloud services or on-premises systems (as discussed in more detail below), there is substantial reason to doubt the reflexive attribution of market power to the largest cloud services providers based merely on revenue share in a specific segment of a broader technology ecosystem.

V. ARE CLOUD USERS REALLY LOCKED IN?

Regulators and some commentators have asserted that users incur high costs when moving data from one provider to another, which in turn purportedly provides cloud services providers with an opportunity to take adverse actions — raising price or degrading service — toward "locked-in" users. Market reality casts doubt on this assertion. Users do incur significant costs when ending a relationship with a provider and moving data to a competitor. However, users widely anticipate lock-in risk and take extensive steps to mitigate it. Specifically, users adopt "multi-cloud" strategies that allocate data applications and data pools across multiple public cloud services providers and, at least in the case of large-entity users, private cloud and on-premises systems. Additionally, a rich market of secondary providers supplies software tools and applications that intermediate between users and cloud providers to facilitate multi-cloud strategies. This is a far cry from the monolithic "cloud market" dominated by two or three providers that appears to have elicited regulatory concern.

The "facts on the ground" in the cloud ecosystem illustrate the oversimplification behind the regulatory model of platform entrenchment and user lock-in, which implausibly assumes that sophisticated business users have no foresight, the state of technology is frozen, and users face a cloud provider monopoly. So long as users anticipate lock-in risk and can adopt strategies to mitigate it (and can select from a menu of data-storage options), cloud service providers cannot take opportunistic actions toward existing users without suffering a market penalty and, as a result, may have little rational incentive to do so. Any immediate gains from opportunistic actions would almost certainly be outweighed by existing users' reluctance to increase usage of the cloud provider's service and potential users' reluctance to subscribe to the cloud provider's service at all. Future revenue losses could be exceptionally large given that much of the potential cloud market remains unserviced (that is, substantial volumes of data have yet to be moved to the cloud) and the future universe of cloud-enabled applications remains by definition uncultivated.

9 Gartner, *Gartner Says Worldwide IaaS Cloud Services Market Grew 41.4% in 2021*, June 2, 2022. Alibaba held 9.5 percent share on a worldwide basis but does not appear to source substantial revenues from North American and European markets.

10 Turbonomics, 2021 State of Multicloud 26 (2021), https://www.ibm.com/downloads/cas/VKW3RNDP.

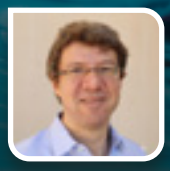
11 Majority Staff Report, *supra* note 6, at 113.

VI. CONCLUSION

Platform markets inherently converge on a small number of providers, which simply reflects the fact that network effects are necessary to unleash the transformative efficiencies generated by the information technologies that underlie these markets. Yet it has long been established, but increasingly overlooked, that high concentration only plausibly raises concerns as a matter of competition policy to the extent that it translates into market power (which must then be shown to rest on exclusionary practices that impede competition on the merits). The conventional wisdom that now prevails among competition regulators and a good deal of scholarly commentary takes the view that the winner-take-most outcomes of platform markets necessarily raise such a high level of competitive risk that preemptive intervention based on quasi-per se liability rules is warranted. Both the history and economics of platform markets cast great doubt on this proposition. Technology history shows that incumbent platforms are often if not typically vulnerable to entry and can rapidly lose market leadership to a more innovative entrant. Given the discrepancy between actual market performance and the theoretical models on which policymakers have relied in proposing and implementing substantial changes from long-standing competition policies, it is time to rethink and reverse course.

THE IMPACT OF ECONOMIC ANALYSIS ON MARKET DEFINITION IN THE CONTEXT OF DIGITAL PLATFORMS

BY NESTOR DUCH-BROWN & WOUTER VERGOTE[1]



1 JRC Seville and ESCP Business School, respectively.

I. INTRODUCTION

Some 40 odd years ago, George Stigler wrote:

> My lament is that this battle on market definitions, which is fought thousands of times what with all the private antitrust suits, has received virtually no attention from us economists. Except for a casual flirtation with cross-elasticities of demand and supply, the determination of markets has remained an undeveloped area of economic research at either the theoretical or empirical level.[2]

It is fair to say that economists certainly took heed of Stigler´s cry for developing economic tools to help defining relevant markets. Theoretical advances in price theory and industrial organization[3], combined with an abundance of (scanner) data have allowed economists to estimate with better precision, whenever the data allow to do so, the demand substitutability between different products and services. This evolution popularized the empirical implementation of the hypothetical monopoly test, or SSNIP test as tools to define markets.

Antitrust authorities followed suit and started to build their cases using these economic contributions and insights in a relatively consistent manner, first in the U.S. and later in the European Union. This was accompanied by transparent communication by competition authorities providing some level of legal certainty to market participants.

However, the economic insights that has helped antitrust authorities to fine-tune their approach to market definition typically apply to traditional brick and mortar markets. With the advent of new communication technologies, new types of (digital) markets started to gain importance. At the heart of these new business models is usually a digital platform, which offers a technology that brings together two or more sets of users (platform sides).

Whereas developments in economic theory and empirics in the 1970s and 1980s facilitated antitrust authorities´ jobs in defining markets, it is not too much of a stretch to say that more recent advances, particularly in the economic theory of (two-sided) platform markets, and more broadly of business ecosystems that use a digital platform at the center of their operations, are upending the application of traditional tools developed by economists to delimit markets based on demand and supply substitutability.

While we now use the word "platform" synonymously with the likes of Airbnb, LinkedIn, or Uber, platform markets are certainly nothing new. The Champagne region in France was well known at the end of the 12th century, well before it became famous for its sparkling wine, for its year-round moving trade fair, attracting merchants, financiers, and other ancillary service providers, such as taverns. The count of Champagne designed the trade rules and necessary security measures in exchange for a small fee for every transaction that was settled on the fair. Such medieval market displays *cross-group network externalities*: the more merchants attend the fair; the more financiers will be interested in travelling to the fair as well to offer their services. The more financiers are present at the fair, the easier it becomes for merchants to finance their dealings.

In present day digital marketplaces this story certainly has a familiar tune to it. Before the end of the 20th century platform markets were relatively small in size, not attracting the same attention as digital platforms received during the last two decades. The arrival of large-scale digital markets (eBay, Amazon, …) very quickly led economists to try to better understand how these markets work. Since the seminal contribution of Rochet & Tirole (2003) an extensive body of (economics) literature, both theoretical and empirical, has studied *two-sided markets*:[4] markets in which two or more groups of market participants interact via a platform and thereby generate cross-group externalities. As a result, optimal pricing in two-sided markets differs fundamentally from pricing in standard markets, as affecting the demand through a price change on one side affects the value of the service on the other side(s) of the platform.

2 Stigler, George J. "The Economists and the Problem of Monopoly." *The American Economic Review* 72, no. 2 (1982): 1–11. http://www.jstor.org/stable/1802294.

3 To which George Stigler markedly contributed.

4 In line with the economics literature, we refer to multi-sided markets as being two-sided even if there are more than two distinct groups involved. See Rochet, J.-C. & J. Tirole (2003). Platform Competition in Two-Sided Markets, Journal of the European Economic Association, vol. 1, n. 4, June 2003, pp. 990–1029.

For the purposes of defining the relevant market, the theoretical insights gained[5] seem to point in the same direction: indirect network effects between different sides of a (digital) platform cause the determination of competitive boundaries to be a more complex exercise. The empirical literature on platform markets[6] has illustrated that such indirect network effects are important in real-life markets. Any competition authority should take heart of these lessons when assessing market definition in a platform setting.

At about the same time the two-sided market revolution kicked off, the concept of a "Digital Business Ecosystem" was coined, in the context of the implementation of the eEurope 2002 action plan,[7] to describe an interdependent group of entities (businesses, governmental and non-governmental agencies, individuals) that share one or more digital platform(s) through which they mutually gain. In the literature these are also known as digital platform ecosystems.

Traditionally, firms have been seen as entities that create value through the development and production of a service, within the boundaries of the firm *in a particular market for that service*. Digital platforms, on the other hand, rely on an ecosystem of autonomous agents that allows them to jointly create value. In a digital platform ecosystem the platform and other *independent* entities complement each another, in a *non-generic* (specific) way, thereby creating value for customers and users. As such, digital platforms bring into being a novel competitive model in which entire digital ecosystems compete with one another.

A good example is the rivalry between the Android and iOS ecosystems. Many observe that these two ecosystems display strong lock-in effects: the variety of services Apple offers for which an iPhone is needed make it very difficult to switch to Android and *vice versa*. High switching costs create barriers to entry and hence may call for antitrust concern which will often require a definition of the relevant market. In a digital ecosystem with interlinked but independent actors, the delineation of the market is more challenging. As Jacobides & Lianos (2021) put it, the *"field of competition is not a single product market, but an ecosystem of complementary products."*[8]

We briefly discuss five important roadblocks towards defining relevant markets that economic analysis of digital markets laid bare during the last 20 years: zero-price markets, personalized pricing, single versus multi-market approach, single-homing versus multi-homing, and digital platform ecosystems.

II. DIGITAL MARKETS AND MARKET DEFINITION: ROADBLOCKS

A. No Price, No Market?

In many digital platform markets one or more groups of participants do not pay for (some version) of the services offered by the platform. Does the absence of a price imply that there is no market and consequently, should antitrust authorities only focus their definition of the relevant market on the paying side(s) of a platform market?

A critical insight from the two-sided markets literature is that not charging one side of the platform is often a perfectly sound business strategy given existing cross-group network effects. This is often the case when one side suffers a negative externality by the presence of the other side (e.g. undesired advertising). In addition, many argue that consumers of zero-price products pay with their data – information - and with their time - attention.[9]

5 For an excellent discussion of these we refer the reader to Evans (2011), Dewenter et al. (2017), OECD (2018) and Franck & Peitz (2019 and 2021). See Evans, David S. & Schmalensee, Richard and Noel, Michael D. and Chang, Howard H. & Garcia-Swartz, Daniel D., Platform Economics: Essays on Multi-Sided Businesses (December 17, 2011). PLATFORM ECONOMICS: ESSAYS ON MULTI-SIDED BUSINESSES, David S. Evans, ed., Competition Policy International, 2011, Available at SSRN: https://ssrn.com/abstract=1974020; Dewenter, Ralf & Heimeshoff, Ulrich, Löw, Franziska. (2017). Market Definition of Platform Markets. 10.13140/RG.2.2.33515.75043; OECD, Rethinking Antitrust Tools for Multi-Sided Platforms. https://www.oecd.org/daf/competition/Rethinking-antitrust-tools-for-multi-sidedplatforms-2018.pdf.

6 For a good overview see Jullien et al. (2021). A paradox though is that despite the progress in digital technologies, there is little data available to run empirical tests for digital platforms. This is an important difference with respect to the empirical analysis of brick-and-mortar markets for which scanner data is often available. See Jullien, B., Pavan, A., Rysman, M., 2021. Two-sided markets, pricing, and network effects. Handbook of Industrial Organization, vol. 4. Elsevier, pp. 485–592.

7 See https://op.europa.eu/en/publication-detail/-/publication/53e45e55-4bd2-42a4-ad25-27b339b051e0.

8 Jacobides, M. G., & Lianos, I. (2021). Ecosystems and competition law in theory and practice. Available at SSRN https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3772366.

9 Newman, J. (2015). Anti-trust in Zero-Price Markets: Foundations, University of Pennsylvania Law Review 164(1):149-2061, DOI: 10.2139/ssrn.2474874.

A zero price of course complicates the application of traditional market definition tools (hypothetical monopolist or "SSNIP" test). Obviously, no percentage price increase can be added to the current zero price. A quick fix would be to add a small but discrete increase in price. The difficulty with this approach is the transaction cost, timewise and psychological, that is associated to paying a small but positive price. A suggested solution is to use the "small but significant non-transitory *decrease in quality*" ("SSNDQ") test.[10]

Even if a quality-adjusted alternative to the SSNIP is used, an additional complication arises in the case of two-sided markets. A hypothetical monopoly will, in the presence of cross-group network externalities, respond to a change of price or quality on its ´zero-price side´ by optimally adjusting its price and/or quality structure at the other side of the market. This effect should be taken into account in order to assess the profitability of the initial increase in price or decrease in quality.

A. Digital Data, Price Discrimination and Market Definition

Digital platforms have access to and collect the information provided by its users.[11] The arrival of big data and data algorithms have permitted firms to obtain fine-grained information that expedited different forms of price discrimination. Many[12] argue that advances in digital tracking allows for more accurate consumer profiling, which in turn helps to facilitate first-degree price discrimination or personalized pricing. Similar arguments can be made about quality discrimination.[13]

In order to define the relevant market in the presence of varying degrees of personalized pricing, the antitrust authority should have a good grasp of the data and the tracking technology available. Given limited information, time, and resources, this is a herculean task.

B. Multi-Market versus Single Market Approach

When ascertaining market definition corresponding to the activities of a digital platform, two avenues have been taken in practice by antitrust authorities. In some cases,[14] a single market approach has been adopted: a particular intermediation service of the platform is considered to be a single market. In other cases, a multi-market approach has been followed: the platform provides (potentially) different services to both sides of the platform, and hence competitive constraints on these services on each side of a platform should be analyzed separately, understanding that the sides are connected through cross-group externalities.

For example, when following the single market approach a credit card company serves as an intermediary between sellers and buyers. This single market approach then tries to understand the competitive constraints imposed by other credit card providers, or other payment systems (such as cash). In contrast, if a multi-market approach is adhered to, a credit card company offers a payment service to both cardholders (a channel through which they can make payments) and vendors (a channel through which they can receive payments), but the service on each side can be subject to different competitive constraints.

Franck & Peitz (2021) argue against the adoption of a single market approach as it does not allow for "different substitution possibilities by the user groups on the two sides of a platform." They continue by saying that "It [the multi-market approach] is based on the economic primitives of the market and not on derived constructs such as an overall demand for an intermediation service, which depends on demand substitutability on each side of the platform as well as on the cross-group network effects linking the two."[15] We agree that using the more flexible multi-market approach allows for different demand substitution patterns on each side, taking into account that these patterns depend on cross-group network effects.

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10 See Quality considerations in the zero-price economy – Note by the European Union. https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/WD(2018)135anddocLanguage=En.

11 For many important platforms, this is at the core of their business model (Facebook, …).

12 See Belleflamme, P. & W. Vergote, (2016), Monopoly price discrimination and privacy: the hidden cost of hiding, Economics Letters, 149, issue C, p. 141-144; Belleflamme, P., Lam, W.M.W. & W. Vergote (2020). Competitive Imperfect Price Discrimination and Market Power. Marketing Science; and Bourreau, M. & de Streel, A. & Graef, I. (2017), Big Data and Competition Policy: Market Power, Personalised Pricing and Advertising (February 16, 2017). Available at SSRN: https://ssrn.com/abstract=2920301 or http://dx.doi.org/10.2139/ssrn.2920301; Franck, J.-U. & M. Peitz (2019). Market definition and market power in the platform economy. CERRE report. May 2019; Franck, J.-U. & M. Peitz (2021). Market definition in the platform economy. CRC TR 224 Discussion Paper Series 2021.

13 See Duch-Brown, N. (2017). "Quality discrimination in online multi-sided markets," JRC Working Papers on Digital Economy 2017-06.

14 Franck & Peitz (2019) provide an excellent overview of recent antitrust practice in line with the single and/or the multi-market approach. See Franck, J.-U. & M. Peitz (2019). Market definition and market power in the platform economy. CERRE report. May 2019.

15 See Franck, J.-U. & M. Peitz (2021). Market definition in the platform economy. CRC TR 224 Discussion Paper Series 2021, p. 16, https://www.wiwi.uni-bonn.de/bgse-papers/boncrc/CRCTR224_2021_259v2.pdf.

C. Single-Homing v. Multi-Homing and Market Tipping

Single-homing, in contrast to multi-homing, refers to the situation in which users decide to use only one (digital) platform when more than one is available. Users typically do so when it saves time, money and "simplifies life" or when joining another platform generates little additional value. Multi-homing, if it exists, can offset feedback loops created by positive network effects, which reduces barriers to entry and lowers the probability of market tipping.

For the purpose of market definition, it is then important, on a case-by-case basis, to identify the presence of factors that facilitate multi-homing decisions such as the cost of joining a platform, the degree of product differentiation between platforms, the existence of contractual clauses which hamper multi-homing and whether other sides of a platform exhibit multi-homing.

D. Digital Platform Ecosystems and Market Definition

The strategic management and the nascent economics literature[16] on digital platform ecosystems observes that digital ecosystems are different from platforms, on which the former are very often built. The term platform usually refers to the technology that promotes the interaction between users, the owner of which controls the parameters of such interaction (access, price, quality, …).

Ecosystems, on the other hand, are more decentralized in nature and result from the interactions, coordinated or not, between the different actors. A central concept in digital ecosystems is the existence of non-generic complementarities.[17] These are the benefits one actor or firm, call her A, receives when another actor, call her B, makes a specific investment(s) making her products complementary with A's services, and vice versa. Jacobides et al. (2018, 2020) define an ecosystem as "a set of actors with varying degrees of multilateral, non-generic complementarities that are not fully hierarchically controlled."[18] These complementarities can be observed on the supply side (production) or on the demand side (consumption).

Digital ecosystems are very often multi-actor and multi-product systems, severely reducing the usefulness of the traditional concept of market definition, which in essence tries to define a single product market, while digital ecosystems compete through a collection of complementary products. Hence, if there exist important supply and demand-side non-generic complementarities, then the traditional relevant market definition based on product and/or geographic substitutability loses its relevance.

The drawbacks of the substitutability method and hence the poignant consequences for competition policy have been highlighted almost exclusively from a theoretical point of view. It is therefore important to empirically confirm, or not, the presence of non-generic complementarities. The empirical literature attempting this is very scant. One recent contribution is Carballa-Smichowski et al. (2021) who document the importance of demand side linkages: 18 percent of 246 major European digital platforms display these types of linkages.[19] Their findings suggest that it may be desirable that antitrust authorities are open to widening the definition of the relevant market by considering markets linked through non-generic complementarities.

III. CONCLUSION

Advances in economic theory certainly helped to develop tools antitrust authorities use to define markets, especially if demand data are available and elasticities can be estimated. However, more recent advances in economic analysis laid bare many complications to the (empirical) application of market definition in digital markets. While further economic and multidisciplinary analysis may certainly be able to offer better guidance to antitrust authorities in the future, one should be careful not to throw the baby out with the bathwater before such guidance is available. Tools,

16 Digital (business) ecosystems received more attention from the strategy literature and only recently from the economics literature (Hein et al. (2020) and OECD Note by Marc Bourreau (2020)). See Hein, A., Schreieck, M., Riasanow, T. et al. Digital platform ecosystems. Electron Markets 30, 87–98 (2020). https://doi.org/10.1007/s12525-019-00377-4; Bourreau, M. and de Streel, A. and Graef, I. (2017), Big Data and Competition Policy: Market Power, Personalised Pricing and Advertising (February 16, 2017). Available at SSRN: https://ssrn.com/abstract=2920301 or http://dx.doi.org/10.2139/ssrn.2920301.

17 This is relevant as in brick-and-mortar markets the main issue behind demand estimation (as the basis for market definition) is based solely on substitution and avoids making any reference to complementarity.

18 See Jacobides, M. G., Cennamo, C., & Gawer, A. (2018). Towards a theory of ecosystems. Strategic management journal, 39(8), 2255–2276; Jacobides, M. G., Cennamo, C., & Gawer, A. (2020). Distinguishing between platforms and ecosystems: Complementarities, value creation, and coordination mechanisms. Working paper, under review.

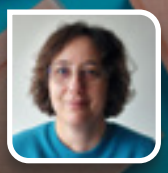
19 Carballa Smichowski B., Duch-Brown N., Gomez Losada A. & Martens B. (2021). "When 'the' market loses its relevance: an empirical analysis of demand-side linkages in platform ecosystems," JRC Working Papers on Digital Economy 2021-07, Joint Research Centre (Seville site).

such as the SSNIP or SSNDQ test, provide a conceptual blueprint to assess demand substitutability in digital markets or ecosystems. This seems to have been a guiding principle of the European Commission´s draft revised market definition notice, which it released on November 8, 2022.[20]

20 European Commission (2022) https://ec.europa.eu/commission/presscorner/detail/en/ip_22_6528.

PLATFORM MARKET DEFINITION IN EU ANTITRUST LAW: THE CASE OF *ANDROID*

BY LILIANE GIARDINO-KARLINGER & ROSSITZA KOTZEVA[1]



1 Both authors are economists at the European Commission (DG Competition/Chief Economist Team). Disclaimer: The views expressed are those of the authors only and cannot be regarded as stating an official position of the European Commission.

I. INTRODUCTION

From payment systems to computer operating systems, search engines, app stores and online marketplaces, competition authorities have been increasingly dealing with companies operating platform business models. While not new – indeed, stock exchanges and ad-supported newspapers and TV have been around for quite some time - these business models have become ubiquitous with the digitalization of the economy and affect ever-increasing portions of our daily life and the economy.

Platforms are complex entities exhibiting features, such as multi-sidedness, extreme (direct and indirect) network effects, and asymmetric price structures, which have allowed a small number of platforms to grow to unprecedented scale and reach. This phenomenon posed challenges to competition law enforcers and has prompted an extensive debate among practitioners and academics alike. Nevertheless, with the growth of the economics literature on multi-sided platforms and the accumulated enforcement experience, our understanding of platform competition and the implications for antitrust enforcement have improved. The EC *Android* Decision[2] and the much-awaited judgment of the General Court[3] on this decision shed new light on this debate, notably on the boundaries of lawful competition in the smart mobile space.

While the Decision and the Court Judgement offer insights and guidance on a wide range of issues, in the present contribution we focus only on those relevant to market definition and dominance in the presence of multi-sided platforms.[4] The market definition in the *Android* case was indeed one of the topics discussed in the judgment, and it illustrates well how the Commission applies the principles laid down in sections 4.4 and 4.5 of the MDN draft currently in consultation.[5]

II. THE MARKETS DEFINED IN THE *ANDROID* CASE – AN OVERVIEW

In the *Android* Decision the Commission established that Google had engaged in anticompetitive conduct by imposing a number of contractual restrictions on Original Equipment Manufacturers ("OEMs"), for simplicity further referred to as device manufacturers, and Mobile Network Operators ("MNOs") in order to protect and strengthen its dominant position in general search services. In light of the specific types of conduct subject to the investigation the Commission identified a number of (complementary) products relevant for the analysis and defined, respectively, a number of interrelated relevant antitrust markets. These markets exhibit features that exemplify many of the key challenges antitrust authorities face with digital market definition:

- The presence of multi-sided platforms
- Complementarities across multi-sided platforms with after-market features[6]
- Indirect constraints from vertically integrated rivals
- Zero-price products

The Court appreciated the complexity of market definition in the context of digital "ecosystems" noting that *"Identifying the conditions of competition relevant to the assessment of the position of economic strength enjoyed by the undertaking concerned may therefore require multi-level or multi-directional examination in order to determine the fact and extent of the various competitive constraints that may be exerted on that undertaking."*[7]

Specifically, the Commission defined four relevant markets and established that Google is dominant in the first three: (1) the market for the licensing of smart mobile Operating Systems ("OSs"); (2) the market for Android app stores; (3) the market for the provision of general search

2 European Commission Decision (2018) Case AT. 40099, *Google Android*.

3 Judgment of the General Court in Case T-604/18, *Google and Alphabet v Commission (Google Android)*.

4 See Franck, J. & M. Peitz (2019) "Market Definition and Market Power in the Platform Economy," CERRE Report, for an extensive discussion of market definition in platform markets. For a more comprehensive analysis, including also the assessment of exclusionary conduct, vertical restraints and efficiencies in multi-sided platform markets, see OECD (2018) Rethinking Antitrust Tools for Multi-Sided Platforms, www.oecd.org/competition/rethinking-antitrust-tools-for-multi-sided-platforms.htm.

5 https://competition-policy.ec.europa.eu/public-consultations/2022-market-definition-notice_en. Sections 4.4 and 4.5 of the Draft Notice provide guidance on market definition in the presence of multi-sided platform and aftermarkets, bundles and digital ecosystems.

6 For a discussion of competition issues in the context of digital ecosystems, see A. Fletcher (2020), *"Digital competition policy: Are ecosystems different?,"* Hearing on Competition Economics of Digital Ecosystems, OECD.

7 Judgement of the General Court (n 2), para 117.

services; and (4) the market for non-OS-specific mobile web browsers. As pointed out by the Court, while the relevant markets are presented separately in the Commission Decision, they are interlinked through complementarities.[8]

The Commission's findings concerning the first two markets were challenged by Google before the General Court and have attracted most attention from commentators. We therefore also focus on those.

III. MULTI-SIDED PLATFORMS

In both markets – for the licensing of mobile OSs and for app stores – the Commission dealt with multi-sided platforms. The different sides that interact on mobile OS and app store platforms were identified in the *Android* decision as being: the device manufacturers (who pre-install mobile OSs and app stores on their devices); app developers (who develop apps for specific mobile OSs and distribute them via app stores); and consumers (who purchase devices and download apps from app stores to consume digital content). An essential feature of multi-sided platforms is the presence of indirect network effects (or cross-side network effects), which imply interdependency of the demands of different user groups and lead to feedback loops. It is commonly agreed that, in order to properly assess the competitive constraints that the platform is subject to, such indirect effects need to be taken into account. In *Android* the Commission did so by defining the relevant markets from the perspective of device manufacturers and by further examining whether Google's market power *vis-a-vis* device manufacturers is constrained sufficiently by indirect effects stemming from competition at the level of app developers and users.

There has been a discussion around the best approach for factoring such effects in the analysis – through defining one market for platform services offered to customers on the different sides (single-market approach) or multiple separate, but interrelated markets. [9] This discussion is also reflected in the revised draft MDN (see para 95). In the *Android* decision the Commission did not explicitly address the distinction between the single and the multi-market approach. However, the approach of the Commission indicates that in practice, independently of how the market is eventually defined, it is natural to examine the different sides of a platform in order to assess in a systematic way the different sources of competitive constraints that the platform is subject to.

Concerning the market for the licensing of smart mobile OSs, in its appeal to the General Court Google essentially criticized the Commission for having defined the market from the perspective of device manufacturers and not of users and app developers[10], and for having failed, as a result, to take proper account of the competitive constraint exerted by Apple. However, the Commission's approach and its conclusions regarding the strength of the indirect constraints at the level of users and app developers were confirmed by the Court.

In that regard, it is worth recalling that market definition is a tool to identify in a systematic way the immediate competitive constraints that a given company faces when offering certain products in a certain area.[11] It is not an abstract exercise but is grounded in the facts of the case. In *Android*, the Commission was investigating clauses in the contracts between Google and device manufacturers that could have distorted competition on the market for general search services. Given that the abusive conduct was at the level of device manufacturers, who decide which OS and apps to install on the mobile devices they offer to consumers, the products licensed to device manufacturers were the starting point for the Commission's assessments. The presence of different competitive alternatives to device manufacturers, on the one hand, and to app developers and users, on the other, was key to the Commission's approach to market definition. Indeed, while app developers have a choice between developing apps for proprietary OSs (such as the iOS and BlackBerry OS) and licensable ones (such as Android OS and Microsoft OS), the alternatives available to device manufacturers are limited to licensable OSs. Such differences in substitution possibilities on the different sides of a multi-sided platform militate in favor of defining separate, albeit interrelated, relevant markets. Consistent with such an approach, the Commission defined a market for licensable smart mobile OSs from the perspective of device manufacturers but also considered the indirect constraints at the level of app developers and mobile device users.

8 Judgement of the General Court (n 2), para 126.

9 For details on the different arguments see, for instance, Filistrucchi, L., Geradin, D., Van Damme, E., & P. Affeldt (2014). "Market definition in two-sided markets: Theory and practice" *Journal of Competition Law and Economics*, 10(2), 293-339. Katz, M. & J. Sallet, *"Multisided Platforms and Antitrust Enforcement"*, The Yale Law Journal, Vol 127 (2018), CERRE Report (2019) (n 3).

10 Judgement of the General Court, para 134 (n 2).

11 Draft Market Definition Notice, para 5 (n 4).

IV. APP STORES

Similarly to smart mobile OSs, multi-sidedness is a feature of app stores and, in that sense, the definition of the relevant market features similar conceptual issues. However, in the case of app stores, there is an additional "after-market" element to the analysis – app stores are specific to an OS – which was an important consideration for the definition of a separate market for Android app stores. A device manufacturer who has decided to install Android on its devices can only preinstall app stores developed for Android on those same devices. Switching to a non-Android app store would require switching from Android to a non-Android OS. [12] However, the Commission concluded that device manufacturers do not have an incentive to do so.[13]

The Commission's assessment of the competitive constraints exerted by non-Android app stores at the level of users and app developers is consistent with a "multiple markets" approach,[14] with Android OS constituting the primary product and app stores for Android forming a separate secondary-product market. In relation to this, Google argued that the Commission erred in not defining systems market where the iOS and the App Store compete as a system against Android and the Play Store. The draft MDN, currently under consultation, outlines the conditions under which defining a system market may be more appropriate compared to defining separate markets for primary and secondary products: (i) the more likely it is that customers take the whole-life costs into account when purchasing the primary product; (ii) the higher the expenditure on (or the value of) the secondary product(s) compared to the expenditure on (or the value of) the primary product; (iii) the higher the degree of substitutability between primary products and the lower the switching costs between primary products; and (iv) when there are no or few suppliers specialized only in the secondary product(s).[15]

Based on the evidence in the *Android* case the Commission did not consider it appropriate to define a system market comprising app stores and smart mobile OSs.[16] In particular, the Commission considered the following factual elements as relevant for this finding:

(i) app stores and smart mobile OS are only components of the smart mobile device and the spending on apps is small compared to the costs of a smart mobile device;
(ii) a user's choice of an app store is determined by its choice of a smart mobile device and the corresponding mobile OS and
(iii) a user cannot, for technical reasons, install an app store that has not been developed for that OS;
(iv) app stores and smart mobile OSs are separate products satisfying different user needs: a smart mobile OS is a system software that controls the basic functions of a smart mobile device and enables users to make use of new combinations of functions, while an app store is an online platform dedicated to enabling users to download, install and manage apps;
(v) Google gives access to Android without the Play Store (namely for those OEMs that did not sign the impugned agreements with Google); and
(vi) there are several players that offer only one of these products (for example Aptoide, LG Electronics, Opera, SFR and Yandex offer an app store but not a smart mobile OS).

V. INDIRECT CONSTRAINT FROM NON-LICENSABLE OSS

A key consideration in the assessment of the competitive constraint faced by Google in the smart mobile OS and app store markets related to the role of non-licensable OSs and, in particular, of Apple's smart mobile OS ("iOS") and App Store. The constraint from the latter could only be indirect given that Apple iOS is proprietary and, hence, not available to device manufacturers for preinstallation on non-Apple mobile phones. The Commission assessed competition from iOS at the user and app developer level and concluded that it is not sufficient to constrain Google's market power *vis-a-vis* device manufacturers.

In its assessment the Commission took account of feedback effects between the two sides and the homing behavior of users and app developers. For instance, the Commission argued (and the Court agreed) that the fact that Android users were unlikely to switch to other OSs as a

12 Decision, recital 285 (n 1).

13 The evidence indicated that neither developers nor users are likely to switch to a non-Android OS in case of a hypothetical small but significant, non-transitory increase of the fees that app stores charge to developers or in case of a hypothetical small but significant, non-transitory deterioration of the quality of the app store.

14 See para 100 of Draft MDN (n 4)

15 Para 101 of the Draft MDN (n 4)

16 See Decision recital 299 (n 1).

result of a small but significant deterioration of the quality of the OS implied that app developers would also lack an incentive to do so (otherwise they would forego access to the large part of mobile device users). Multihoming by app developers reinforced that conclusion.

Moreover, the issue of the strength of the competitive constraint exerted by Apple has to be viewed in the context of the case and the specific theory of harm. In that respect, that Google Search was set as the default search on Apple's mobile internet browser was an important factual element.[17]

VI. FREE GOODS AND THE SSNDQ

Another important feature of Google's business model, which the Commission had to account for in its market definition and dominance assessment, was that the Android OS and the Play Store (alongside other Google products), were offered free of charge to final consumers.[18] *Android* is, therefore, yet another case where the Commission defined relevant antitrust markets around "free" goods in the context of multisided platform markets. Such an approach reflects the fact that zero prices and, for that matter subsidies (i.e. negative prices), may well be part of a platform's profit-maximizing strategy.[19] From an economic perspective it is uncontroversial that, depending on the type and strength of cross-side network effects, a platform may have an incentive to set a highly asymmetric price structure, where users on one (or more) sides are offered "free" access to the platform products or services. In practice, the presence of products offered without direct remuneration implies focusing the assessment of competitive constraints on parameters of competition other than price. In *Android*, the Commission examined the extent of demand substitutability in terms of, among other things, the quality of the OS and app stores.[20]

VII. CONCLUSION

Among the new elements in the European Commission's Draft Market Definition Notice (currently under review) is additional guidance on market definition in specific circumstances such as multi-sided markets and digital ecosystems. This guidance is grounded in the Commission's enforcement experience, of which the 2018 *Android* decision and the General Court's 2022 judgment in the *Android* case are an integral part. The mobile ecosystem at the heart of the *Android* decision exhibits a number of the characteristics that are typical of platform businesses, such as the presence of multi-sided markets, complementarities across multi-sided platforms with after-market features, indirect constraints from vertically integrated rivals, and zero-price products. The *Android* decision illustrates how the Commission applies the general principles laid out in the draft MDN in light of the specific facts and circumstances of the case. In particular, the General Court sided with the Commission in confirming that, taking account of the specific facts and circumstances of the case, competition from iOS at the user and app developer level is not sufficient to constrain Google's market power *vis-a-vis* device manufacturers for licensable mobile OSs, and that a multiple-market approach is warranted whereby app stores for Android form a separate (secondary-product) market.

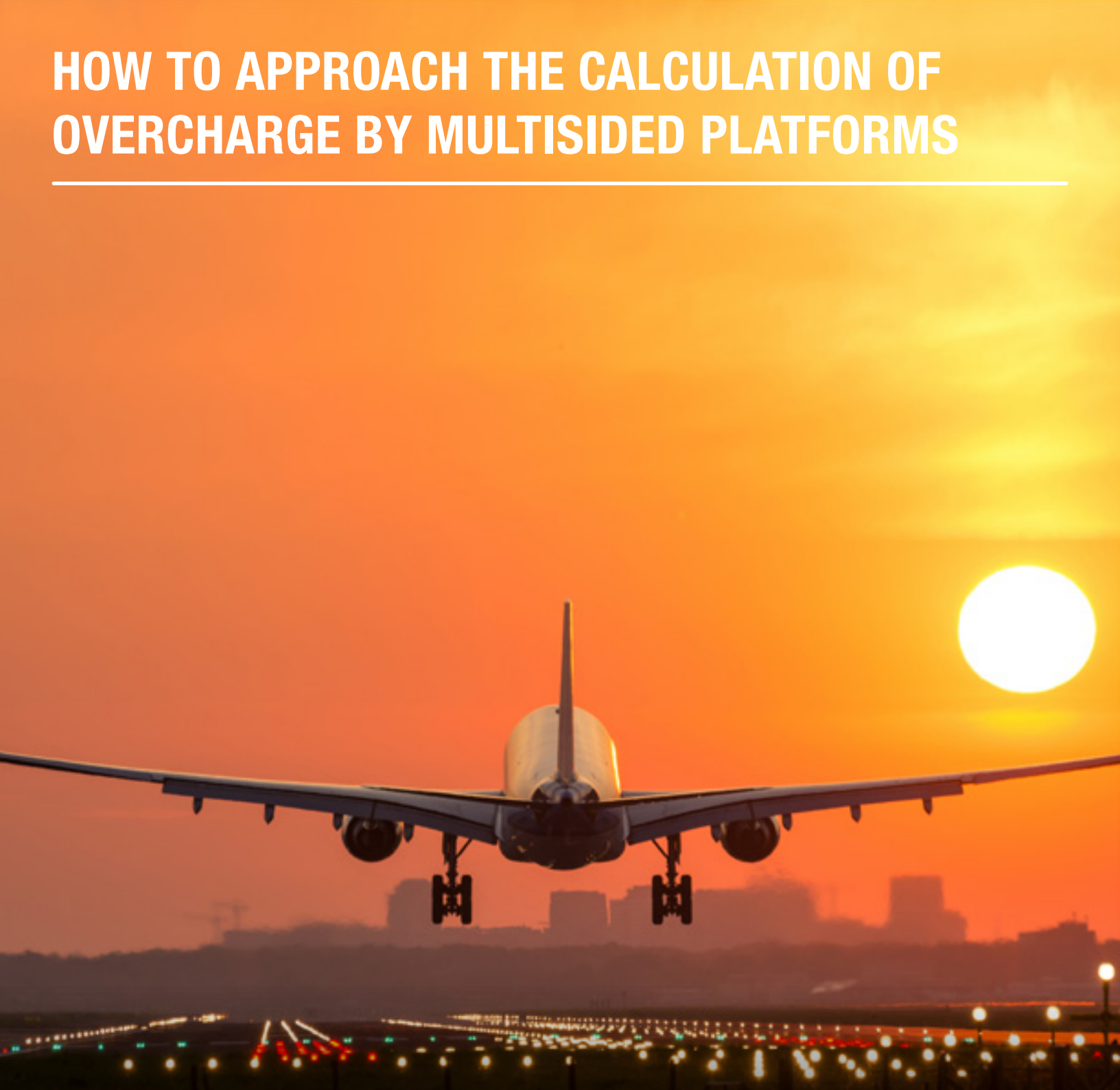
17 Also discussed by the General Court at paras 271-273 (n 1).

18 Decision, recital 107 (n 1).

19 See CERRE report (2019), Section 3.3.1 (n 3) and Cremer, J., Montjoye, Y. & H. Schweitzer (2021), "Report: Competition Policy for the digital era", European Commission, p.44, for the economic considerations explaining why it may be optimal for a platform to offer products for free. See also Draft MDN, paras 97 and 98.

20 The conceptual framework on which the Commission relied on to assess whether manufacturers, users and application developers would switch away from Android app stores to app stores for other licensable smart mobile operating systems was that of a small but significant non-transitory decrease of quality ("SSNDQ") of the former (Decision, recitals 284-305). The General Court confirmed the relevance of the SSNDQ framework for the purpose of defining the relevant market (Judgement of the General Court, para 177).

HOW TO APPROACH THE CALCULATION OF OVERCHARGE BY MULTISIDED PLATFORMS



BY ROSA M. ABRANTES-METZ & ALBERT D. METZ[1]

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The famous (some may say infamous) *AMEX* decision has introduced and strengthened a great deal of economic jargon into the legal lexicon; "multisided platforms," "transaction platforms," "indirect network effects" and "two-sided analysis" quickly come to mind. As is often the case, sometimes such descriptive words precede any precise, scientific definition. What, after all, is a "two-sided analysis?" For that matter, how – formulaically – are indirect network effects defined and measured? Ask any economist and you will likely get an answer; ask another and you will likely get a different one.

While there may not yet be textbook levels of consensus on several of these points, there are some common ideas in the literature.[2] In this brief note, we will explore some generally accepted concepts, how they relate to measures of market power, and how they support the calculation of at least one source of antitrust damages, the price overcharge. We will necessarily speak in generalities and "typical" circumstances, which is useful (we think), but it must always be remembered that particular cases come down to particular facts and circumstances.

I. FUNDING TWO-SIDED PLATFORMS

By now, many are familiar with the concept of "platforms" and "two-sidedness." Two-sided platforms come in a variety of forms, but broadly speaking we can consider two types. The first is a *transaction platform*. As the name suggests, this platform brings together buyers and sellers. Such a platform can be thought of as a (virtual) store. The second type is a content distributor. This platform allows creators to disseminate content to consumers. Such a platform can be thought of as a (virtual) bulletin board.

These types are probably not exhaustive and are certainly not mutually exclusive. Indeed, one can easily imagine cases which overlap. What if the platform facilitates the distribution of music on a pay-for-play basis? Is that a store selling music (a transaction platform), or a way for musicians to be heard (a content distributor)? It may not matter what label we put on it in any particular instance. This taxonomy, like all others, it is meant to be helpful, and the helpful question is whether the platform in question is more like a store or more like a radio.

Usually, the more interesting economic question is how the platform is monetized. Here, again, we can think of two basic funding models: *transactional and subscription*. A transaction-funded platform collects (and sometimes pays) money on each transaction which takes place; if a dollar changes hands, the platform gets its cut, much like a tax collector.[3] A subscription-funded platform collects (and sometimes pays) money for access, regardless of subsequent participation on the network; think of a cover charge to get into a club.

A credit card network is a transaction platform which is transaction-funded.[4] It brings together buyers and sellers, and then takes a cut of any money which changes hands. Facebook (or Meta, of you prefer), is a subscription-funded contentment distributor. Advertisers pay for access,[5] and users create content to show to other users.

Are all transaction platforms necessarily transaction-funded? They do not need to be, at least in principle. One could imagine a platform which brings together an exclusive set of sellers or negotiates generous price discounts from popular sellers, and then charges consumers a subscription fee for access to this network. And of course, some platforms (including some credit cards) are a hybrid model, charging cardholders an annual (subscription) fee in addition to collecting a toll on each transaction.

An open question in economics is how the choice of funding model affects network growth and platform competition, if indeed it does.[6] "Indirect network effects," which for the moment we will define simply as whether the participants on one side value the level of participation on the other, are clearly at play in the subscription-funded model. "Good" clubs can charge a higher cover charge than "bad" clubs; just so, a "large" network could presumably charge a higher subscription price than a "small" network if the size of the network matters, i.e. if there are strong (indirect) network effects. Advertising during the Super Bowl is more expensive than advertising at 2:00 am on Sunday. This would suggest that

2 For a brief survey, see Rosa Abrantes-Metz, Michael Cragg, Albert Metz & Minjae Song, December 2021, "Understanding the Economics of Platforms," American Bar Association, Antitrust Law Section, *The Antitrust Magazine*.

3 In principle, the platform could charge a fixed fee (e.g. $0.50) or a percentage (e.g. 5 percent of the transaction value) or both for handling the transaction. In practice, most cases we are familiar with tend to price as a percentage of transaction value.

4 Specifically, American Express also charges a subscription fee, but that tends to be an exception.

5 Even this may be a simplification. Advertising payment models can become complicated. When an advertiser pays for "clicks" but not for display, the funding model begins to resemble the transaction model.

6 It can be shown that in some models of a monopolist platform, the choice of funding model is irrelevant.

in subscription-funded cases, incumbency might be of great value: other things equal, a new entrant can only compete with a large incumbent by offering a much lower (perhaps even negative) subscription price.

On the other hand, intuition might suggest that this is less true in the case of transaction-funded networks. If holding a credit card were costless (which it certainly isn't), then why would it matter how many stores were "on the other side" to accept it? One could hold literally every card (in economic jargon, multi-home), and then use whichever one the store happened to accept, up to and including cards which were only accepted in one store.

At the same time, from the stores' perspective, if all customers hold all cards, the store could choose to accept only the lowest cost cards. This intuition would suggest that in the case of transaction-funded networks, the platform might not be able to charge a higher *transaction* price just because it covers a larger network of stores or consumers.[7] The intuition breaks down to some extent when we remember that it is costly to hold and carry a card, so the choice of card will importantly depend on the depth of the store network which accepts it. And, of course, even if the participants are less concerned with the depth of participation on the other side, the platform itself is deeply concerned and will work to achieve balanced participation. Even if "indirect network effects" are weaker for a transaction-funded network than a subscription-funded network, other things equal, those effects may still be very strong in an absolute sense.

II. THE NET TWO-SIDED PRICE

To date, antitrust cases have largely involved transaction-funded platforms such as credit cards, healthcare transaction networks, and travel and booking networks. For this reason, in what follows, we shall concern ourselves with platforms of this type.[8]

A well-known result in the economics literature is that a transaction-funded platform may find it optimal to charge a premium to one side in order to subsidize the other as it seeks to balance participation. A platform with sellers but no buyers will have no transactions, and in this funding model it will earn no revenues. It might be optimal to charge restaurants so that it can pay diners, for example.

This basic insight motivates the interest in "two-sided analysis." In *AMEX*, the court recognized that even if one side of the platform is paying what might appear to be a supra-competitive price, economic analysis must also consider to what extent that may be generating subsidies to the other side.

For a transaction-funded platform which collects a price p1 from one side and p2 from the other (prices which could be zero or even negative), then the platform's net price is simply $p = p1 + p2$. In some cases that might be a price per transaction, while in others that might be a price per dollar of transaction value. Either way, a two-sided analysis must consider whether this net price is, in some sense, supra-competitive. As *AMEX* recognized, even if price *p1* may seem "too high" in isolation, so long as it is used to subsidize a low or even negative price *p2*, then the net price *p* – that is, the price actually retained by the platform – may be consistent with competitive levels.

III. INDICIA OF MARKET POWER

One common indicator of market power in antitrust cases is to compare prices to marginal costs. Since a price-taking firm should produce output until the two are equal, observing prices well above marginal cost would often indicate either sub-optimal behavior from the firm or some degree of pricing power.

In the case of a two-sided transaction-funded platform, such a comparison is presumably not meaningful on a one-sided basis. As we discussed above, platforms may charge premium prices to one side and subsidize the other, breaking the link between price and cost on a

7 In the seminal Rochet & Tirole (2003) paper, the demand for card services is actually independent of the number of agents "on the other side," meaning consumers are not willing to pay more for a card just because it has a large network of stores, and stores and not willing to pay more for a card just because it has a large number of consumers. Armstrong (2006) notes that "cross-group externalities are weaker with per-transaction charges."

8 Economic literature provides several analyses of subscriptions platforms. For an analysis of a monopolist in both one- and two-sided contexts, see [available at Rosa Abrantes-Metz & Albert Metz, 2020, "The Dynamics of Single- and Multi-Sided Monopolies," Working Paper, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3692861]. For an analysis of collusion between one-sided subscription networks, see Rosa Abrantes-Metz & Albert Metz, 2021, "Collusion and Network Effects: Modelling the Dynamics of Single- and Multi-Sided Platforms," Working Paper, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3869687]. Finally, for an analysis of competition between one-sided subscription networks, see Rosa Abrantes-Metz & Albert Metz, 2021, "Collusion and Network Effects: Modeling the Dynamics of Single- and Multisided Platforms," Working Paper, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4186062.

one-sided basis. Instead, the analogous comparison would be in terms of the net price per transaction or per transaction dollar, depending on the case, with marginal costs measured correspondingly.[9]

Arguably, there is no principled reason why comparing net price with marginal cost is less informative in the case of two-sided platforms than in any other case, but there is reason to expect such an analysis to be more complicated. Marginal costs may be difficult to measure, and platforms may be characterized by substantial fixed costs in the short-run. Also, while the widget maker decides how many widgets to produce, a platform may have limited control over the number (let alone dollar volume) of transactions which take place. The platform brings together sellers with buyers, but if the buyers don't like what the sellers are offering (at the prices they are offering), few transactions will take place.

Another measure of market power, and one which has been adopted by courts, is profitability. Under the ideal of "perfect competition," firms should enter an industry until profit has been competed away on the margin. Observing persistent, positive profit could indicate a barrier to entry.

The notion of profit here is economic profit and is distinct from *operating* profit. Operating profit compares revenues with operating costs. If a firm ceases operations, it will receive no revenue but, by definition, incur no operating costs and hence have zero operating profit. Since "zero operating profit" is always achievable, it would generally make sense for a firm with negative operating profit to shut down. We would therefore expect to find positive operating profits among operating firms.

Economic profit, on the other hand, is a measure of "total" profit net of all costs including the opportunity cost of capital. If operating profit compares the value of an enterprise against the alternative of shutting down, economic profit compares the value of an enterprise against its best alternative, which is presumably not simply "shutting down." We note though, that an economist calculating economic profits may make additional adjustments to profits than just simply subtract the opportunity cost of capital from operating profits.

For example, a firm may be carrying goodwill from having been acquired at a value higher than its book and/or market value at the time of the acquisition. Depending on the specifics of the case, it may be appropriate to exclude from costs for the purpose of more adequately reflect the true economic profitability of the firm.[10] Another appropriate adjustment may be to add back to the economic profit calculation of the firm those profits already distributed to owners, particularly if that profit sharing is in the form of a reduction or something else other than a declared dividend. We note that these adjustments are only for an economic profit calculation, and are not bound by GAAP rules.

Just as the theory of perfect competition predicts that prices should equal marginal costs, that same theory predicts that economic profit should be zero. Allowing for some heterogeneity among firms, it at least predicts that marginal profit should be zero (or negative). The intuition is quite simple. If the "next" entrant expects positive economic profit, that means – by definition – that entering this industry is truly the best possible use of the entrant's capital, and so the entrant should enter. That should continue until the "next "entrant does not expect positive economic profit.

While "zero economic profit" represents a sort of ideal, firm heterogeneity, for example, might explain persistent, positive profits among established incumbent firms. But, it should still be the case that marginal profits are "small" to explain why no more firms enter. Thus, persistent and "large" profits continue to be an indicator of some kind of barrier to entry. If this is a profitable industry, people should enter, unless they can't, for example, because of anticompetitive conduct.

How can one establish whether observed profits are "large" or "small"? One successful approach has been to benchmark to similar firms or similar industries which are not suspected of engaging in anti-competitive conduct which might foreclose entry. Observing outsized profits in conjunction with a coherent theory of harm can be powerful evidence that effective artificial barriers to entry exist. For example, recently at the trial for *US Airways (for American Airlines) v. Sabre*, evidence was showed comparing Sabre's economic profits during the relevant time period for the anticompetitive conduct, to those of twelve comparable peer technology companies selected by Sabre's financial advisors. Sabre's profits were 5-10 times larger than the average profits for the comparable companies. In its decision from May 2021, the Court found Sabre to have monopolized distribution of airline tickets.[11]

9 It could be the case, though it might be unexpected, that while the price is in terms of transaction dollars, the costs are in terms of transactions (or vice versa). This would happen if, for example, the platform collects 10 percent of the money which changes hands but incurs costs of $0.10 per transaction regardless of transaction size. Such a fundamental mismatch would of course complicate the analysis.

10 Abrantes-Metz testified on how to calculate economic profits for the multisided platform Sabre, in *US Airways v. Sabre*.

11 Order for Judgment, May 25, 2022, in *US Airways v. Sabre*, Southern District of New York, 11 Civ. 2725 (LGS).

Another potential approach is to measure whether profits changed coincident with a change in firm behaviour. If there is a "before" or "after" period which is not suspected of being tainted, profits observed during those periods can also provide a useful benchmark.

Whether compared to different firms at the same time, or to the same firm at different times, a valid benchmark not only helps establish whether barriers to entry likely exist but also serves the useful purpose of providing a quantitative measure of what profit levels could reasonably be expected in a but-for world.

IV. TRANSLATING SURPLUS PROFIT INTO PRICE OVERCHARGES

We now come full circle. For transaction-funded platforms, we explained above that the net price reflects "both sides" of the platform. Even if the platform is paying a subsidy to Side B after collecting a premium from Side A, the net price measures how much the platform is keeping for itself. If that net price is well above costs, the platform will be very profitable. At the same time, if the platform is enjoying surplus economic profits, it can only be because its net transaction price is well above cost. Thus, whether we focus on a traditional Lerner equation or whether we focus on economic profits, these are really just different ways of saying the same thing.

Our choice of whether to focus on *price* directly or instead on *profit* (from which price will be backed out) will largely be driven by practical concerns since both have a solid theoretical foundation. A price analysis requires a careful measure of marginal costs, both short-run and long-run. A profit analysis also requires careful measures but has the benefit that accounting and financial statement data are, at least usually, a good point of departure.

Perhaps more importantly, economic theory does not have strong predictions about how prices should compare between firms selling different products. Economics does not predict that the price of an apple should converge to the price of an orange. And how should one compare "price" if one platform charges a fixed fee per transaction while another platform charges a fixed percentage? But economics does predict that marginal economic profit should approach zero for both the apple famer as well as the orange farmer. And for the widget maker. And for the digital multimedia international conglomerate.

In other words, even if *prices* (and price structures) are very different between two platforms, so that price benchmarks are not well-defined, it can still be the case that *profit* margins are similar, so that profit benchmarks are well-defined, and more easily comparable across similar industries. We note this is particularly appealing in monopolized markets, where the economist is asked to calculate the but-for world competitive price. It may well be the case that there is a lack of comparable competitors, selling the same product, because we are in the presence of a monopolist. But economic profit margins are fairly comparable across similar industries, from which but-for world economic profit benchmarks can extracted.

Suppose that our suspect platform, Platform X, has enjoyed economic profit margins of 50 percent. Suppose that an economic analysis of costs, risks, and markets suggests that Platform Y is a reasonable benchmark, and it has enjoyed economic profit margins of 10 percent. Translating that surplus profit into a net overcharge damage is often a fairly direct chain of calculations. We may be able to compute the but-for net price (the two-sided price) which would have generated profits of 10 percent, holding the volume of transactions constant. The difference in prices is the net price overcharge collected by the platform.

As with other overcharge measures, this calculation does not take account of foregone transactions. In other words, it would often be the case that by lowering the price to one (or both sides), more transactions likely would have occurred in the but-for world.

If the but-for net price is lower, then it must be the case that the but-for price for at least one side is lower. Suppose that in the actual world, Platform X charged a net transaction price of $1.00 when earning its 50 percent profit margin. That could be because it charged $1.00 to one side and nothing to the other, or $0.50 to both, or $2.00 to one side while paying a $1.00 subsidy to other. All of these different pricing structures lead to the same $1.00 net price, which, again, means that Platform X kept $1.00 on every transaction on its platform.

Now suppose that the but-for net price is $0.50, meaning that a net price of $0.50 applied to the same volume of transactions would have generated the benchmark profit of 10 percent. That could be achieved by cutting the price to one side by $0.50, or by increasing the subsidy to the other side by $0.50, or any combination in between. But at least one of the one-sided prices (and possibly both) must be lower in the but-for world.

A measure of but-for, competitive economic profit can be translated into a but-for, competitive net price for a transaction-funded platform. By itself, it does not tell us precisely how those savings would have been distributed between the two sides. To answer that, if an answer is

truly necessary, requires an analysis of indirect network effects and relative demand elasticity. As a rule of thumb, the side with the more elastic demand would be expected to receive a greater share of the price savings. And so would the side providing the most value to the other side of the platform (i.e. the side with the strongest indirect network effects). This will be the focus of a future article.

V. CONCLUSION

In this short article, we have reviewed the economics of platforms with a particular emphasis on the different funding models available to two-sided platforms. We have argued that economic profit margins can serve as not only meaningful indicators of market power, but also provide a practically useful quantitative benchmark of the but-for world. That benchmark can be translated into a but-for net (two-sided) price, leading directly to a calculation of overcharge by the platform.

While the net price overcharge is uniquely determined for a given profit benchmark, the precise allocation of the overcharge between the two sides can depend on market frictions and the relative strength of indirect network effects and demand elasticities. Whether this precise allocation is required will, of course, depend on the particulars of the case.

COMPARE THE MARKETS: TWO-SIDED MARKET DEFINITION IN THE *COMPARETHEMARKET* CASE

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I. INTRODUCTION

Market definition in the context of two-sided platforms has been subject to debate in competition policy for some time.[2] The judgment of the UK Competition Appeal Tribunal ("CAT") in *BGL/Comparethemarket v. Competition and Markets Authority* provides useful additional guidance, but also leaves questions unanswered.[3]

This case arose following the Competition and Markets Authority's ("CMA") infringement decision against BGL for the use of wide most-favored-nation ("MFNs") clauses (also known as price parity clauses) in the distribution of home insurance by its price comparison website ("PCW") Comparethemarket.[4] In the UK, PCWs emerged in the early 2000s, quickly becoming a popular way for consumers to search for, and purchase, insurance products.

The CMA recognized that these PCWs are, in general, a "force for good,"[5] stimulating competition between suppliers by engaging consumers and assisting in search and comparison, thereby countering consumer inertia (the majority of home insurance policies in the UK continue to be renewed each year, without the customer looking to switch). However, concerns arose about PCWs' use of MFNs — in particular, *wide MFNs,* which require suppliers to offer the PCW their best price and not offer a lower price on another PCW or online channel.

In 2015, the CMA had prohibited the use of wide MFNs by PCWs in the private motor insurance market.[6] In 2017, it opened a Chapter 1 and Article 101 TFEU investigation into Comparethemarket's use of wide MFNs in home insurance, which resulted in an infringement decision and fine of £17.9m in November 2020.[7] CompareTheMarket was the most popular PCW for home insurance products, with approximately 50% of sales through this channel; however, this fell to approximately 15% when other channels (including renewals) were taken into account, rendering PCWs a small part of the overall market. Understanding whether home insurance sales through these other channels formed part of the relevant market was important in assessing the competitive effects.

Common questions in the general platform market definition debate considered in this case include:

- How many markets should be defined? A single market encapsulating competitive constraints on both sides of the PCW platform (insurers and consumers) or one for each side?

- How should competitive constraints faced by the PCW platform be assessed?

- How to apply the SSNIP (small but significant and non-transitory increase in price) test when the platform's consumer prices are zero?

In cases involving two-sided platforms, the answers to these questions have not always been consistent. In *MasterCard*,[8] the European Commission defined several interrelated markets, considering that the definition of one single market would ignore the different levels of competitive interactions in payment card platforms: the platform (competing with other payment methods); the acquiring banks on one side of the platform (competing for the business of merchants): and the issuing banks on the other side (competing for cardholders). This approach was generally followed in subsequent cases involving payment card schemes across Europe. Yet, in *Amex*,[9] the U.S. Supreme Court took a different view: it found that if both sides of customers (merchants and cardholders) are required to participate at the same time for a transaction to occur then one single market must be defined. The Commission's merger control decisions (e.g. in *Microsoft/LinkedIn*) seem to have shifted towards a position

2 See, for example, European Commission (2021), "Support study accompanying the evaluation of the Commission Notice on the definition of relevant market for the purposes of Community competition law," Final study, section 3, and Niels G. and Ralston, H. (2021), "Two-sided market definition: some common misunderstandings," European Competition Journal, 17:1, 118-133.

3 Competition Appeal Tribunal judgment (2022), Case No: 1380/1/12/21 BGL (Holdings) Limited & Others v. Competition and Markets Authority, 8 August.

4 CMA (2021), "Case 50505 Price comparison website: use of most favoured nation clauses," Non-confidential infringement decision.

5 CMA (2017), "Digital comparison tools market study," Final report, 26 September, para. 2.

6 CMA (2014), "Private motor insurance market investigation," Final report, 24 September; CMA (2015), "The Private Motor Insurance Market Investigation Order 2015," 18 March, para. 4.1

7 CMA (2021), "Case 50505 Price comparison website: use of most favoured nation clauses," Non-confidential infringement decision.

8 CJEU, Case C-382/12P, EU:C:2014/2201, 11 September 2014.

9 *Ohio et al. v. American Express Co. et al.*, 138.Ct. 2274 (2018).

of defining one single market for transaction platforms,[10] and the UK CMA has also adopted this approach, for example in cases involving online restaurant platforms.[11]

In terms of *how* to define the relevant markets, indirect network effects between the two sides of the platform may make demand substitution more complex to assess, but this complexity is not insurmountable. In European competition policy, we have observed a degree of consensus on the usefulness of the SSNIP test, at least as a thought framework, which from an economics perspective is appropriate. This was recently confirmed in the Commission's draft updated Market Definition Notice (issued for consultation in November 2022).[12] The value of the SSNIP test in exploring demand substitution was also confirmed by the CAT in *Comparethemarket*. In earlier European cases involving two-sided platforms — e.g. the Swedish and Italian competition investigations into hotel booking platform Booking.com — the focus was often on a comparison of product characteristics, and potential competitors that did not look like Booking.com were rejected.[13] In comparison, in *Comparethemarket*, the CAT embraced the use of the SSNIP test to understand demand-side substitutability (as had the CMA and the BGL itself).

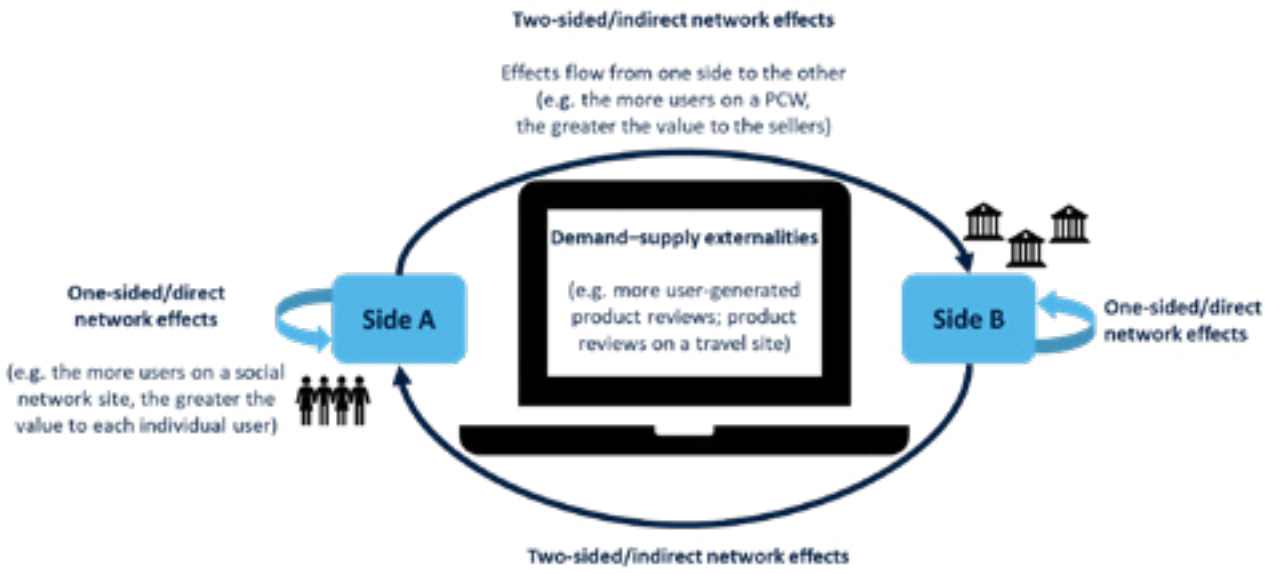
II. WHEN IS A PLATFORM TWO-SIDED?

The label "two-sided platform" is commonly used for all sorts of digital platforms, not just in competition policy but also in the business community. But when is an intermediary a truly two-sided platform and what does this mean for market definition?

Two-sidedness arises when a platform serves two groups of consumers, and the platform's value to one group increases with the use of the platform by the other group — commonly referred to as indirect or two-sided network effects.

In the case of PCWs such network effects are clear: the value of the PCW to an insurer increases with the number of consumers browsing on the PCW, as this raises the chance that the insurer makes a sale; similarly, the value of the PCW to consumers increases with the number of insurers available on the PCW. In this case, the indirect network effects work in both directions: from consumers to insurers and vice versa. Sometimes, however, indirect network effects go in only one direction — e.g. with social media platforms, the value of the platform to advertisers increases with the number of consumers using the platform, but it is less clear that the value of the platform to consumers increases with the number of advertisers (it may in fact decrease).

Figure 1 Types of network effects



Source: Oxera.

10 European Commission, Case M.8124, *Microsoft/LinkedIn*, 6 December 2016.

11 CMA (2017), "Just Eat and Hungryhouse: A report on the anticipated acquisition by JUST EAT plc of Hungryhouse Holdings Limited," 16 November.

12 European Commission (2022), "Commission Notice on the definition of the relevant market for the purposes of Union competition law," 8 November.

13 Konkurrensverket, Decision 15/04/2015, Ref. no. 596/2013; Autorità Garante della Concorrenza e del Mercato, Provvedimento n. 25422, I779 - Mercato dei servizi turistici-prenotazioni alberghiere online, Bollettino n. 14, 27 Apr 2015.

As illustrated in Figure 1, network effects can also be single-sided (between the same type of user), in which case they are often referred to as "direct" network effects — examples include users on a social network site and traders in a financial market.

Network effects may not be the only economic characteristic exhibited by a platform. When defining markets it is important to be explicit about all characteristics to avoid over-generalizing. Moreover, the two-sided network effects may not always be strong, in which case the traditional approach to market definition may require only minimal adjustment.

Supermarkets, for example, also serve two user group that benefit from one another — producers and consumers — as do airports, restaurants, music festivals, business conferences, but in comparison to digital platforms, the two-sided network effects in these situations tend to be relatively weak. There are only so many brands a supermarket can stack on its shelves and consumers who can fit in a store. In such situations, other characteristics can be more important to factor into the approach to market definition — for example, the role played by supermarkets in vertical supply chains, and the economies of scale, density and scope that can arise.

One trap to avoid with two-sided platforms is an assumption that competitors must all share the same product characteristics as the provider of the focal product. What matters is substitutability in the eyes of users, not the product characteristics as such. The CAT judgment makes an important finding in this respect. It highlights that PCWs are simply the latest addition to the many ways consumers and insurers transact with one another, and that to overlook the potential competitive constraint of traditional intermediaries and direct channels is an error:[14]

> Ultimately, the Decision fails to see what it calls Price Comparison Services in their true and proper context, which is as an insurance intermediary. […] These days, intermediaries come in all shapes and sizes: thus, the seller of a product will often seek to sell insurance also. The price comparison website is a (relatively late) addition to the list of indirect channels or Interfaces by way of which insurance products can be sold. […] It is a failure to understand this dimension that is a hallmark of the Decision.

III. HOW TO TEST BOTH SIDES PROPERLY: ONE SSNIP OR TWO?

When defining the relevant market for a two-sided platform, does one need to test one or two markets, and with one or two SSNIP tests?

Among the three parties involved — the CMA, BGL and the CAT — the *Comparethemarket* case discussed all possible combinations. The CMA proposed one overall market and one SSNIP test; BGL proposed one market encompassing both sides and two SSNIP tests that need to be considered together; while the CAT defined two separate markets with two different SSNIP tests. This range of options reflects the ongoing debate in the economic literature that has yet to reach a consensus on how many separate markets should be defined when dealing with multi-sided markets (perhaps because there is no single correct method).[15] However, what ultimately matters is whether the exercise of market definition properly identifies the existing constraints from other channels (e.g. direct insurer websites, brokers, renewals) on the hypothetical monopolist platform, which competes on both sides simultaneously.

While all parties agreed that both sides need to be properly tested, the CMA took the view that the same constraints apply to both sides of the market, and hence that one SSNIP test is sufficient to ascertain the substitutability of both insurers and consumers. In its view, an increase in the commission fee paid by insurers to PCWs would directly test whether insurers would switch to other channels in sufficient numbers to constrain the hypothetical monopolist. Up to this point, all parties agreed that this is an appropriate test for the insurers' side, or, as the CAT put it, "a vanilla" application of the SSNIP test.[16] On this side of the market, the CAT agreed with the CMA's conclusion that insurers are unlikely to be a sufficient constraint on the hypothetical monopolist and will continue using the PCW even if the fees increase — i.e. the CAT defined a narrow market on the insurers side (BGL had shown evidence that disputed this finding).

However, the CMA went on to argue that since the insurers could pass on the fee increase in their insurance retail price, the same thought experiment will also test for a degradation in the conditions on the consumer side. Both BGL and the CAT criticized the CMA approach

14 Competition Appeal Tribunal judgment (2022), Case No: 1380/1/12/21 BGL (Holdings) Limited & Others v. Competition and Markets Authority, 8 August, para 128.

15 See Niels, G. (2019), "Transaction versus non-transaction platforms: A false dichotomy in two-sided market definition," Journal of Competition Law & Economics, 15:2–3, 327–357; European Commission (2021), "Support study accompanying the evaluation of the Commission Notice on the definition of relevant market for the purposes of Community competition law," 1 June, p.41, section 3.1.1.

16 Competition Appeal Tribunal judgment (2022), Case No: 1380/1/12/21 BGL (Holdings) Limited & Others v. Competition and Markets Authority, 8 August, para. 138.

to testing both sides of the market with a single SSNIP test for doing only half the test required to define the market.[17] This is because the hypothetical increase in retail price faced by consumers through the CMA's pass-on assumption would have been too small to test a SSNIP properly, as this pass-on of commissions represented an increase of only 1.8–3.5% in the retail price of insurance.[18]

So, how can one test the consumer side properly when no price is charged? The starting point for defining a relevant market is to identify the relevant price and non-price dimensions of competition. The conceptual framework of the SSNIP can be applied to each, although the P in SSNIP refers to price. Below we consider the advantages and disadvantages of the tests considered on the consumer side in the *Comparethemarket case.*

A. SSNIP on Price Dimensions

The traditional SSNIP test is applied to the price dimension. In *Comparethemarket*, the challenge was that none of the PCWs, which together formed the hypothetical monopolist, charged their users to use the website. The PCWs' business model is to charge commissions to insurers when policies are sold. Thus, applying the usual 5–10% SSNIP to a zero price on the consumer side would not lead to a change in market conditions because 10% of zero is still zero. While the economic literature has recognized that the absence of a price on which to apply the SSNIP test adds complexity, this challenge can be overcome by adapting the standard SSNIP test.

In particular, while the PCWs did not charge users who searched for home insurance quotes, they did seek to make their site attractive to users by encouraging insurers to offer attractive retail prices — i.e. the PCW users did pay once they purchased insurance from a provider they found via the PCW. As such, BGL proposed to focus the SSNIP test on the consumer side on this price-related dimension. This was in line with the dimension tested indirectly by the CMA under the assumption that the increase in commission on the insurer side will be passed on by the insurers to consumers, but with the notable change that it would have applied a material increase as required by the "significant" condition in the SSNIP test. Since PCWs users are generally price-sensitive, this is an appropriate dimension on which to test how they would react if prices increase once the hypothetical monopolist takes actions that worsen the retail price on that side of the market.

The CAT considered that such a retail price test would be inadequate because (i) it is difficult to see how consumers would be aware of the price increase and (ii) it only captures the substitutability of consumers who actually end up buying an insurance policy, not of those who simply browse the PCW. In the CAT's view, these latter consumers are also relevant to the market that is being tested,[19] and it therefore proposed a "special" SSNIP test that introduced a positive price for access on the consumer side which could be:[20]

> an absolute charge for using the service (e.g., £2 per comparison or an annual subscription of £5 for unlimited use) or an element in the Premium charged to such consumers only that specifically itemizes the cost of the service (e.g. 5% of the Premium is attributable to the price comparison service)

The CAT approach is not without controversy. For many services, the SSNIP test is applied to the sale price even though there are consumers who browse but do not purchase. For example, the usual SSNIP test for a supermarket considers the impact on the hypothetical monopolist's profits if consumers switch away in response to an increase in the displayed price of the products it offers without imposing changes on how consumers access the supermarket. In focusing on the browsing consumers, the CAT's test seems to overlook the main constraint imposed by consumers; namely the forgone commission fee the PCW receives when a browsing consumer makes a purchase.

To illustrate this, consider a scenario where all consumers who purchase on a PCW are rational and know that the saving they make via this intermediary is higher than the access charge. In this case, they will continue to use the PCW and generate a commission for the hypothetical monopolist. Even if the browsing consumers switch to other channels, the hypothetical monopolist will still find it profitable to increase the price based on the purchasers. This highlights that the emphasis on browsing consumers is misplaced and may be influenced by the CAT's decision to separate the consumer side from the insurer side, where the commission is paid upon a sale.

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17 Competition Appeal Tribunal judgment (2022), Case No: 1380/1/12/21 BGL (Holdings) Limited & Others v. Competition and Markets Authority, 8 August, paras 95(7) and 102(1).

18 Competition Appeal Tribunal judgment (2022), Case No: 1380/1/12/21 BGL (Holdings) Limited & Others v. Competition and Markets Authority, 8 August, para. 139(2)(i).

19 Competition Appeal Tribunal judgment (2022), Case No: 1380/1/12/21 BGL (Holdings) Limited & Others v. Competition and Markets Authority, 8 August, paras 139(2)(ii) and 144(8).

20 Competition Appeal Tribunal judgment (2022), Case No: 1380/1/12/21 BGL (Holdings) Limited & Others v. Competition and Markets Authority, 8 August, para. 144(9).

Furthermore, both forms of the "special" SSNIP test proposed by the CAT have their shortcomings.

The option of introducing a direct charge for making a query or a subscription price to the PCW is not entirely novel and has been previously considered as a SSNIP alternative in markets with zero prices. However, it is important to approach this carefully because it fundamentally changes the business model for the hypothetical monopolist and moves away from market reality. Especially in two-sided markets where not charging one side of the market is common, moving from paying nothing to a small positive price is a rather radical change, and may not be an optimal choice for a hypothetical monopolist that is maximizing its profit on both sides at the same time.

Moreover, behavioral economics highlights that goods with zero prices are perceived differently by consumers, as they have a higher intrinsic value — there is something special about "free."[21] Thus, charging £2 instead of nothing has a more negative impact on consumers' decisions than increasing the price from £2 to £4. This consumer reaction risks exaggerating the effect of the price introduction, and could lead to frequently finding wide markets on the consumer side when a zero price is involved. Caution is needed to ensure that the positive charge is not leading to a change beyond what is required by the "small but significant" part of the SSNIP test.

The second form of the SSNIP test proposed by the CAT — a 5 percent surcharge in the premium price of insurance applied to all users of a PCW — is not that different from the SSNIP test on the retail price which we discussed above. Both approaches test the price sensitivity of consumers who make a purchase. While the CAT seems to indicate that the surcharge would apply to all consumers browsing a PCW regardless of the channel they ultimately use to buy their insurance, this is likely to be unfeasible in practice. To illustrate this, consider that this surcharge will need to be applied after visiting a PCW to three different groups of consumers: (i) PCW users who buy insurance from an insurer they discovered on the PCW; (ii) PCW users who then decide to buy insurance directly from an insurer they did not discover on the PCW; and (iii) PCW users who then decide to buy insurance by accepting their renewal offer. In the absence of a mechanism to track users across channels and the ability to charge them for the use of the PCW (especially when the user purchases from an insurer that has no connection with the PCW), it is highly unlikely that the hypothetical monopolist could enforce a surcharge on those PCW users, and it is more likely to enforce the additional 5% surcharge only on its own website. This practical difficulty in the thought experiment proposed by the CAT means that the 5 percent surcharge test would most likely materialize in the same manner as a 5 percent increase in the retail prices displayed on the PCW.

B. SSNIP on Non-price Dimensions

The price dimensions are not the only options to test for market definition. The Commission's draft Market Definition Notice acknowledges that "non-price elements are particularly relevant for the assessment of substitution" when a zero price is present on the consumer side, and considers, as an alternative, assessment of "the switching behavior of customers in response to a small but significant non-transitory decrease of quality ('SSNDQ')."[22] It is generally accepted that testing non-price dimensions can be more difficult, but there are examples where it has been done. For example, the Commission used an SSNDQ test in *Google Android* to assess whether manufacturers, users and application developers would switch away from app stores for Android to app stores for other licensable smart mobile operating systems in the event of an SSNDQ.[23]

In *Comparethemarket*, the most relevant qualitative dimensions of competition on the consumer side included the level of marketing and advertising undertaken by the PCW to attract users and the usefulness of the comparison service. For example, an important way through which PCWs attract consumers to their websites are online advertising or catchy TV adverts featuring well-known actors and singers, or mascots such as meerkats. While the usefulness of a website is difficult to assess, a change in marketing and advertising spend is one dimension that can more easily be tested in market definition. A decrease in this dimension by the hypothetical monopolist would have an impact on the visibility of the PCW channel compared to other distribution channels, and can highlight where consumers would divert.

This type of analysis has been considered by the CMA, for example in the *Hunter Douglas/247 Home Furnishings* merger. The CMA assessed the closeness of competition between the merging parties using the ranking of competitors on Google search paid and organic search results, which is a manifestation of the marketing and advertising spend of a firm.[24]

21 Shampanier, K., Mazar, N. and Ariely, D. (2007), "Zero as a special price: The true value of free products," Marketing Science, 26, 742-757.

22 European Commission (2022), "Commission Notice on the definition of the relevant market for the purposes of Union competition law," 8 November, paras 97–98 and footnote 47.

23 European Commission (2018), Case AT.40099, Google Android, 18 July, paras 284–305.

24 CMA (2020), Case Hunter Douglas N.V. / 247 Home Furnishings Ltd merger inquiry, Final report, 14 September, paras 8.21–8.53.

Even though similar information on the ranking of competitors from other channels was available in *Comparethemarket*, the CAT overall took the view that non-price dimensions are too difficult to use and did not discuss further the possibility of applying a SSNIP on the consumer side along these dimensions. We consider that the information in this case did lend itself to an SSNDQ on marketing and advertising.

The rise in online advertising as an important channel to reach consumers means that there is reliable information that can be used to understand the impact of marketing on consumers' behavior and a firm's profitability, which renders feasible the use of an SSNDQ in market definition. For example, online search engines that provide advertising services, share relevant metrics such as the list of competitors listed in response to a query such as "home insurance" with those that take part in their advertising auctions. Importantly, as with the SSNIP test itself, one must focus on the hypothetical monopolist, and therefore the competition between the firms that are considered part of the hypothetical monopolist (here: the rival PCWs) needs to be disregarded. This means that one needs to examine what happens if all PCWs in home insurance reduce their marketing and advertising budget at the same time by the same percentage. Intuitively, one would expect that a reduction in the number of times the hypothetical monopolist bids to show an advert is an opportunity for a competitor channel to attract that consumer to switch. The CAT did not engage with this type of test in the *Comparethemarket* case.

IV. CONCLUSION: TEST BOTH SIDES, WHETHER IN ONE OR TWO MARKETS

The *Comparethemarket* case proved a battleground for different approaches to two-sided market definition. One of the most important messages to emerge from the case is that in two-sided platforms there needs to be a proper test for competitive constraints on both sides, even if prices are zero on one side. Such platforms compete on both sides simultaneously. They set prices and other competitive parameters so as to attract users on both sides, taking into account the externalities between the two sides. A hypothetical platform monopolist would do the same. For this reason it makes sense to define a single platform market, assessing the constraints on both sides. However, the same aim can in principle be achieved by defining two markets, one for each side (as the CAT preferred), provided that the network effects between the sides are taken into account.

A challenging question that may arise under either approach is what to do if the answer to the SSNIP question differs between the two sides: a SSNIP is profitable on one side of the platform, but not on the other side. This would indicate that the platform has a degree of market power on one side, but still faces strong competitive constraints on the other side. If the business practice or agreement in question has effects on both sides, the competitive constraints on both sides are relevant. The CAT did not explicitly address this question, although it ultimately concluded that there was no evidence of harmful effects from Comparethemarket's wide MFNs on either side.

Many platforms have a business model in which one side is charged a zero price, in order to attract users and thus make the platform more valuable to users on the other side. In such situations it is still meaningful, and feasible, to assess market definition on non-price competitive dimensions, as also recognized in the Commission's draft Market Definition Notice. The CAT's approach to introduce a small price where previously there was none is also a feasible test, although one that must be applied with caution, since going from "free" to a non-zero price could be interpreted by consumers as something more than a "small but significant increase in price."

MARKET DEFINITION AND THREE 19A DESIGNATIONS UNDER GERMAN ANTITRUST LAW: ALPHABET, META, AND AMAZON

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I. INTRODUCTION

Section 19a of the German Competition Act[2] sits between traditional competition law and sector regulation.[3] Targeted at Big Tech, it aims to rebalance the power between the Bundeskartellamt on one side and designated large digital platforms on the other. In particular, the competition authority benefits from a reversal of the burden of proof regarding the anticompetitive nature of certain conduct by 19a firms. Interventions can, on the one hand, be more far-reaching than under the EU Digital Markets Act ("DMA"). On the other hand, however, 19a firms remain free to demonstrate that a certain conduct is "objectively justified."

To intervene under section 19a the Bundeskartellamt must first designate an undertaking as a 19a firm. This requires two things: The undertaking has to be active "to a significant extent on markets within the meaning of section 18(3a)" and it has to be of "paramount significance for competition across markets" (section 19a(1)). Section 18(3a) provides guidance on the assessment of a platform's market position by mentioning several features that deserve consideration. In assessing whether an undertaking is an addressee of section 19a, the legislator then provides the authority with a non-exhaustive list of five criteria that must be taken into account, including criteria 1, 3, and 5:

1. dominance on one or more markets,
3. vertical integration and activities on otherwise related markets,
5. gatekeeper position.[4]

Market definition plays an instrumental role for all three criteria.[5] We note that the designation process is not primarily driven by quantitative criteria, as in the DMA, but requires a detailed assessment of the business model of the designated platform operator, including the description of the markets in which it is active and its position in these markets. An identification of products and services and possible substitution possibilities appear to be essential in addressing the three criteria.[6]

Section 19a came into force at the beginning of 2021. Since then, the Bundeskartellamt has made three designation decisions (Alphabet,[7] Meta,[8] and Amazon[9]), which are effective for five years.[10] While Amazon has appealed the decision,[11] Alphabet[12] and Meta have come to terms with their 19a designation, which surprised some observers in the case of Meta, as the firm had until then been notorious in Germany for

2 Gesetz gegen Wettbewerbsbeschränkungen (GWB).

3 For a short guide to section 19a, see Franck J-U & M Peitz, Digital Platforms and the New 19a Tool in the German Competition Act, Journal of European Competition Law & Practice 12, 513–52 ("Franck and Peitz (2021a)"). See also Franck J-U & M Peitz, Section 19a of the Reformed German Competition Act: A (Too) Powerful Weapon to Tame Big Tech? CPI Antitrust Chronicle March 2021.

4 Competition Act, section 19a(1), 2nd sentence, no. 5 ("the importance of its activities for third parties' access to supply and sales markets and its related influence on third parties' business activities").

5 Franck & Peitz (2021a, p. 517).

6 Market definition and market power are connected. In the context of digital platforms Franck & Peitz (2021b) elaborate on the former and Franck & Peitz (2023) on the latter. Franck J-U & M Peitz, Market Definition in the Platform Economy, Cambridge Yearbook of European Legal Studies 23, 91–127 ("Franck & Peitz (2021b)") and Franck J-U & M Peitz, Market Power of Digital Platforms, Oxford Review of Economic Policy, forthcoming 2023 ("Franck & Peitz (2023)"). Preprint available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4205570.

7 Bundeskartellamt, December 30, 2021, B7 – 61/21 ("Alphabet 19a designation decision"). In the following we will quote from the translation of the decision that has been made available by Alphabet and published on the Bundeskartellamt's website.

8 Bundeskartellamt, May 2, 2022, B6 – 27/21 ("Meta 19a designation decision"). In the following we will quote from the "convenience translation" published by the Bundeskartellamt based on a translation that has been made available by Meta.

9 Bundeskartellamt, July 5, 2022, B2 – 55/21 ("Amazon 19a designation decision"). In the following we will quote from the "convenience translation" published by the Bundeskartellamt based on a translation that has been made available by Amazon.

10 Section 19a(1), 1st and 2nd sentences of the Competition Act.

11 Bundeskartellamt, Press Release of November 14, 2022 ("Extension of ongoing proceedings against Amazon to also include an examination pursuant to Section 19a of the German Competition Act (GWB)").

12 Bundeskartellamt, Alphabet 19a designation decision (n 7) para 46.

exhausting all available avenues of appeal. The Amazon decision will now be reviewed by the Bundesgerichtshof, the German Federal Court of Justice, acting as court of first and last instance.[13] A designation procedure regarding Apple is still pending.[14]

While the outcomes of the designation procedures against Alphabet, Meta, and Amazon are hardly surprising, the Bundeskartellamt provides a detailed reasoning, which sheds light on how it deals with market definition in the context of section 19a. The following questions may arise: How does the authority apply the concept of market definition? Can indications perhaps be gleaned from the Bundeskartellamt's remarks, reasoning, and focus as to which conduct might be considered particularly relevant in future investigations? In this short contribution, we do not aim to answer those questions fully. Instead, we highlight and critically discuss several noteworthy aspects in the Bundeskartellamt's designation decisions with respect to market definition.

II. THE DESIGNATION DECISIONS: ALPHABET (GOOGLE), META (FACEBOOK), AND AMAZON

A. Alphabet (Google)

Alphabet is active in several areas, all of which fall under section 18(3a). In its designation decision the Bundeskartellamt lists and discusses Google Search, YouTube, Android and its App Store, and Chrome.[15] Relatively little consideration has been dedicated to Google's virtual assistant and its map service. The latter is particularly surprising given the authority's ongoing 19a investigation into Google Maps, examining possible anticompetitive restrictions to the detriment of other map services providers.[16]

In its decision, the Bundeskartellamt ultimately commits itself to only one definition of a market, namely the German market for general search services *vis-à-vis* search users, dominated by Google.[17] Thus, for the first time the authority has clarified that specialized search engines must not be included in this market. It asserts that general search services may address a particular information demand "which can in principle extend to the entire internet" and which cannot be met by a specialized search engine.[18] In contrast, the latter's users typically have an interest in a specific topic (flights, hotels, price comparisons, etc.), which may not be served in the same way by a general search service as it does not offer to limit a query by means of topic-related filters.[19]

Moreover, the Bundeskartellamt assumes that trading platforms such as Amazon Marketplace, which the authority regards as a particular case of a specialized search engine, are not part of the market because users typically only search for products on those platforms when they have already formed an intention to buy.[20] While this seems a plausible hypothesis, on the one hand, it begs the question of how often products are ultimately purchased on a trading platform for which the user had not originally searched. The design of the Amazon affiliate program indicates that the platform considers such purchases to be significant: commissions are paid not only if an advertised product is purchased via an affiliate link but also if a customer is directed to Amazon and purchases a non-advertised product within a certain period ("indirect sales"). On the other hand, sellers may use Google Ads to become visible precisely to those users of the search service that look for information with a clear intention of buying. From the seller's point of view, therefore, the intermediation services offered by Google and Amazon appear to be more interchangeable than the Bundeskartellamt suggests.

Furthermore, the authority puts emphasis on the fact that the respective business models differ: While general search services are almost exclusively financed via search-based advertising, specialized search engines monetize search results through compensation agreements (typically success-based) with content providers.[21] One thing to note here is that there appears to be an increasing tendency among platform

13 On the abridged judicial review in 19a cases see Franck and Peitz (2021a, p. 525).

14 Bundeskartellamt, Press Release of June 21, 2021 ("Proceeding against Apple based on new rules for large digital companies (section 19a(1) GWB) – Bundeskartellamt examines Apple's significance for competition across markets").

15 See, for example, the authority's explanations given as to Google's dominant position in the German market for general search services and its "strong market position/power regarding other activities," Bundeskartellamt, Alphabet 19a designation decision (n 7) paras 230–323.

16 Bundeskartellamt, Press Release of June 21, 2022 ("Proceeding against Google for possible anti-competitive restrictions of map services (Google Maps Platform)").

17 Bundeskartellamt, Alphabet 19a designation decision (n 7) paras 62, 86, 230, 234–262.

18 Bundeskartellamt, Alphabet 19a designation decision (n 7) para 249.

19 Bundeskartellamt, Alphabet 19a designation decision (n 7) para 250.

20 Bundeskartellamt, Alphabet 19a designation decision (n 7) para 251.

21 Bundeskartellamt, Alphabet 19a designation decision (n 7) para 253.

operators such as Amazon Marketplace and Booking.com to rely on financing through advertising. Most importantly, however, the authority leaves the reader in the dark about the significance that different monetization is supposed to have for demand substitutability and thus for defining the market.

Finally, the authority suggests that, in the market for general search services, there is no need to differentiate between desktop and mobile search because it appears that the same operators offer the same services with only slight variations in presentation. In view of Google's dominant position in each segment, however, the authority could leave this open.[22]

Without ultimately adopting this position, the Bundeskartellamt points out that other competition authorities, above all the Commission in *Google Search (AdSense)* (2019) and in *Google/Fitbit* (2020), have defined a market for search-based advertising, dominated by Google.[23] Note the authority's observation that trading platforms such as Amazon Marketplace or providers of display advertising could not be regarded as direct competitors as they pursue a different business model.[24] In addition, the authority emphasized that, from advertisers' perspective, advertising via Amazon could only be considered interchangeable with advertising services provided through Google Search in a subsegment of product sales.[25]

B. Meta (Facebook)

The Bundeskartellamt identifies Facebook, Instagram, and WhatsApp as the most important platforms operated by Meta. It observes that Facebook caters to various user groups:

> Facebook social network offering … is primarily aimed at private users and content providers ("publishers"). In addition, the platform also includes the Facebook developer platform ("Meta for Developers"), which can be used by third-party companies to develop their services via the "Facebook Business Tools" and other software products and programming interfaces, among other things.[26]

The Bundeskartellamt set out in detail these and other offerings, including services provided to advertisers. It observes that,

> based on its service description, Meta offers intermediary services with the ad-financed social network Facebook as well as with the ad-financed photo and video network Instagram, which are a combination of a network and a multi-sided market.[27]

While the wording is somewhat unfortunate (an undertaking operates on a "market" but is not a "market," at any rate not in the sense of antitrust law), we can interpret that Facebook and Instagram are multisided platforms (which include a social network leading to network effect between consumers), as there are cross-group network effects between various user groups.

The Bundeskartellamt then narrows down the relevant user groups:

> The relevant user groups of the services are, in essence, private users who use Facebook and Instagram without monetary consideration on the one hand, and, on the other hand, the group of advertisers who, in return for payment, use the services to place targeted adverts based on user data there.[28]

Hand-in-hand with the identification of various user groups, the Bundeskartellamt identifies separate markets for intermediation services supplied to (1) advertisers, (2) content providers, (3) developers, and (4) private users.[29] Thus, the authority adopts a multi-markets ap-

22 Bundeskartellamt, Alphabet 19a designation decision (n 7) para 258.

23 Bundeskartellamt, Alphabet 19a designation decision (n 7) para 310.

24 Bundeskartellamt, Alphabet 19a designation decision (n 7) para 316.

25 Bundeskartellamt, Alphabet 19a designation decision (n 7) para 316.

26 Bundeskartellamt, Meta 19a designation decision (n 8) para 11.

27 Bundeskartellamt, Meta 19a designation decision (n 8) para 86.

28 Bundeskartellamt, Meta 19a designation decision (n 8) para 87.

29 Bundeskartellamt, Meta 19a designation decision (n 8) paras 127–132.

proach,[30] while at the same time describing this as an exception to the general assumption that activities of two-sided (matching) platforms can also be adequately captured through a single-market approach.[31]

There is arguably one additional important user group that has not been separately identified and appreciated. This group consists of individual users behaving as influencers—their raison d'être is to engage a large number of consumers and to make money from contracts with brand manufacturers; they do not engage with a group of friends and family, as end users do. The success and contestability of a social network arguably also depend on the influencer side and constitute a separate market that was not considered in the designation decision. To the extent that influencers are subsumed into the group of content providers, the Bundeskartellamt acknowledges their presence and points to the interdependence between consumers and content provider decisions.[32]

In a future analysis of Facebook as a multisided platform, the Bundeskartellamt could evaluate the extent to which Facebook/Instagram is a gatekeeper for consumers' attention for entertainment and social media content (and to what extent it is competing with streaming platforms such as YouTube). The authority could assess lock-in effects on the influencer side (as well as content and product providers) on Facebook/Instagram and the extent of multihoming by influencers and other user groups to understand whether there is a separate market on the Facebook/Instagram platform or whether good substitutes exist on other platforms.

With respect to WhatsApp, the Bundeskartellamt notes that it

> is in functional terms still largely operated separately from Facebook and Instagram, but is nevertheless an essential part of the Meta ecosystem focused on social media and can also be regarded as indirectly monetized via advertising on Facebook and Instagram.[33]

WhatsApp, Facebook Messenger, and offers by other companies such as Viber are characterized as messenger services and (alongside video conferencing services) separated from the social network market.[34] While not explicitly defined in the decision, a market for messenger services appears to have been implicitly assumed.[35] Considering the various connected activities of Meta, the Bundeskartellamt concludes that:

> Meta operates a strong, data-driven ecosystem in the entire sector of ad-financed social media, which due to strong lock-in effects on private and business users poses the risk of competition mostly existing only in certain specific areas and competitors being permanently pushed to the fringes of the ecosystem … As a result, Meta's ecosystem holds a position which extends across various markets with blurred market boundaries and which is difficult or impossible for other companies to challenge.[36]

While the Bundeskartellamt looks beyond individual markets, it returns to the market of social network services for end users and social media advertising for advertisers as the markets of main concern:

> With its core service Facebook, Meta holds a dominant position on the national platform and network market for social networks for private users; in the area of social media advertising, the company is at least very strong.[37]

The finding of Facebook's dominant position in a market for social network services provided to private users must be seen as a cornerstone to establish the 19a status of Meta.[38] The assessment of dominance relies on a market definition that emphasized the supposedly unique functionalities of Facebook. For example, the Bundeskartellamt states that,

30 Bundeskartellamt, Meta 19a designation decision (n 8) para 129.

31 Bundeskartellamt, Meta 19a designation decision (n 8) para 129.

32 Bundeskartellamt, Meta 19a designation decision (n 8) paras 94–96 and 131.

33 Bundeskartellamt, Meta 19a designation decision (n 8) para 105.

34 Bundeskartellamt, Meta 19a designation decision (n 8) para 150.

35 See Bundeskartellamt, Meta 19a designation decision (n 8) paras 344–358.

36 Bundeskartellamt, Meta 19a designation decision (n 8) para 114; see also para 668.

37 Bundeskartellamt, Meta 19a designation decision (n 8) para 117.

38 Bundeskartellamt, Meta 19a designation decision (n 8) para 126.

> although TikTok belongs to the social media area in the broader sense, it is primarily a content-sharing platform with a strong focus on videos and therefore, like YouTube or the similarly classified service Snapchat, cannot be assigned to the social network market despite partial overlaps.[39]

At this point, the authority does not rely on empirically verified demand substitutability but on the attempt to put offers into different pigeonholes on the basis of objective product features: Only items in the same pigeonhole belong to the same market. The fact that Facebook has apparently rapidly lost users in certain demographic groups[40] is not considered as evidence of relevant substitution effects at work. Unfortunately, such an approach bears the risk of rendering market definition an activity that may be remote from reality. Instead, an empirical assessment of substitution patterns over time in different demographic user groups can lead to a more informed assessment of actual market boundaries. Arguably, if such a more in-depth analysis of substitution patterns is performed, the destination exercise may become too cumbersome.

Finally, it is noteworthy that the Bundeskartellamt explains in detail that, according to the results of its investigation, a separate national market for social media advertising should be defined (on which Meta, with its advertising products on Facebook and Instagram, had to be considered dominant[41]). However, it ultimately leaves this point open.[42] Excluded from this market would be search-based advertising (Google),[43] traditional display and banner advertising,[44] and instream video advertising (YouTube, Twitch).[45] The authority commits itself to the first aspect but leaves the latter two aspects open. To demonstrate a specific demand for social media advertisement and, thus, to substantiate this narrow market definition, the authority mainly relies on a survey of 29 media agencies and of 15 of Meta's competitors in social media.[46]

C. Amazon

Amazon provides a retail environment in which it provides consumers with the possibility to search for physical and digital products and to purchase the selected product, which may be Amazon's own brand, a different brand provided by the brand manufacturer itself, a different brand sold through Amazon retail, a different brand sold by a third-party seller who contracts Amazon's logistics services (Fulfilled by Amazon, FBA), or a different brand sold by a non-FBA seller (to be precise, a third-party seller may decide to use FBA not for all but part of the product portfolio that it sells).

The Bundeskartellamt provides a detailed reasoning for defining a national market for the provision of online marketplace services for professional (third-party) sellers,[47] which is dominated by Amazon:[48]

> the Amazon marketplace is to be assigned as a separate market for the provision of online marketplace services for professional sellers, at least with regard to the market side of third-party sellers.[49]

While the authority thus adopts a multi-markets approach, it states elsewhere, en passant, that it considers a single-market approach, in general, to be equally adequate for the analysis of so-called matching platforms such as Amazon Marketplace. According to the authority, this might be different in this case as Amazon has integrated its retail business and its marketplace, which could be seen as evidence that the different user groups had different views on the functional interchangeability of the intermediary service provided by the platform.[50] In contrast to this view, as discussed in detail elsewhere, we believe that competition authorities would be well advised to consistently use a multi-markets

39 Bundeskartellamt, Meta 19a designation decision (n 8) para 155.

40 See Bundeskartellamt, Meta 19a designation decision (n 8) paras 195 ("TikTok serves a different age group than Facebook") and 334.

41 Bundeskartellamt, Meta 19a designation decision (n 8) para 277.

42 Bundeskartellamt, Meta 19a designation decision (n 8) para 211–276.

43 Bundeskartellamt, Meta 19a designation decision (n 8) para 243–252.

44 Bundeskartellamt, Meta 19a designation decision (n 8) para 253–265.

45 Bundeskartellamt, Meta 19a designation decision (n 8) para 266–274.

46 Bundeskartellamt, Meta 19a designation decision (n 8) para 220,

47 Bundeskartellamt, Amazon 19a designation decision (n 9) paras 92–173.

48 Bundeskartellamt, Amazon 19a designation decision (n 9) paras 174–261.

49 Bundeskartellamt, Amazon 19a designation decision (n 9) para 94.

50 Bundeskartellamt, Amazon 19a designation decision (n 9) para 107.

approach in defining markets in the context of platforms that mediate transactions between two user groups.[51] Indeed, it is a priori unclear to us how a single-market approach could have been made operational in the present case.

One particular item in need of further discussion is the analysis of Amazon in relation to social media platforms. The Bundeskartellamt notes:

> The purchasing options currently available in Germany via social media … do not allow a purchase to be concluded directly on the platform, but require the seller to have an external online shop in which the purchase is concluded. It is therefore … not a sale via a social media platform. Just like the use of product and price comparison sites or paid advertising, the use of stores on Facebook or Instagram thus represents sales promotion measures aimed at increasing sales via the undertaking's own online shop … In this respect, the services offered by Meta … differ significantly from the services offered by online marketplace operators. Functional substitutability is therefore ruled out from the perspective of the sellers for this reason alone.[52]

The market definition here may have somewhat hastily followed the motto "what looks different needs to be separated." After all, considering the availability of software solutions such as Shopify (which offers an integrated suite including payment and logistics), even small sellers can easily run online shops. For this reason alone, it seems surprising that substitution possibilities based on social media marketing are ruled out so quickly. Furthermore, the statement above also seems inconsistent with the findings in the 19a decision on Meta, where it says:

> Via the "Shops" section of Instagram and Facebook, it is increasingly possible to find out more about the products in question directly on Instagram and Facebook and, depending on how the offer is designed, *to purchase them directly*. Facebook Pay can – as far as it is already available – also be used as a means of payment, which further shortens the path from (first) noticing a certain product to purchasing it.[53]

Certainly, the way of contacting potential customers differs. Social media can reach different customer groups or stimulate different purchases ("impulse purchases") than Amazon's marketplace. Nevertheless, there may be greater potential for demand substitutability here than suggested by the authority. Given the overall importance of Amazon as a matchmaker, this would, in all likelihood, not have affected the outcome of the designation decision but may matter for subsequent analyses and decisions.[54]

It is noteworthy that the Bundeskartellamt recognizes that demand substitutability differs for the type of third-party retailer considered. It points out that several alternatives to Amazon Marketplace in Germany operate as closed platforms and many third-party sellers active on Amazon would not qualify as sellers on those closed platforms.[55] Substitution possibilities depend on the type of product category.[56] For example, in the product categories of clothing and accessories, Zalando is an important competitor on the consumer side. Like Amazon, Zalando operates in a dual mode and runs its partner program for third-party sellers. The fact that the Bundeskartellamt nonetheless does not take a more granular approach may be defended on the ground that the outcome of the designation decision would ultimately not be affected given the generally strong position of Amazon in e-commerce overall. However, the evaluation of the contestability of Amazon's market position (as well as potential remedies if it comes to that in the future) should take this into account.

III. TAKEAWAYS

Defining one (dominated) market. A pattern emerges from the three 19a decisions. In each case, the Bundeskartellamt defines precisely one (national) market and establishes the dominance of the respective platform operator: Google (Alphabet) dominates the market for general search

51 Franck & Peitz (2021b, pp 102–108).

52 Bundeskartellamt, Amazon 19a designation decision (n 9) para 147. See also para 120, where the use of social media platforms is characterized as a mere input for the operation of a seller's own online shop.

53 Bundeskartellamt, Meta 19a designation decision (n 8) para 333 (emphasis added).

54 The Bundeskartellamt seems to assume the opposite. See Amazon 19a designation decision (n 9) para 127 ("for sellers, the online marketplace services offered to them by marketplace operators cannot be substituted by sales via their own online shop, or at best only to a very limited extent"). To strengthen their claim, the Bundeskartellamt compares visitor numbers to digital marketplaces with large online shops (paras 128–129). However, this assessment appears to be incomplete as there may be a long tail for online shops. As a side remark, policy interventions in the market for targeted advertising are likely to affect substitution possibility.

55 Bundeskartellamt, Amazon 19a designation decision (n 9) para 250.

56 Bundeskartellamt, Amazon 19a designation decision (n 9) para 251.

services *vis-à-vis* search users; Facebook (Meta) the market for social network services provided to private users; Amazon the market for the provision of online marketplace services to professional (third-party) sellers. Although market dominance is not a prerequisite for 19a addressee status,[57] it is a very important factor in this respect. Consequently, the underlying market definition in each case is also essential for the three designation decisions. The finding of market dominance in all cases serves as an anchor for further considerations by which the authority demonstrates the platform operator's "paramount significance for competition across markets."

Advertising markets. In other respects, the competition authority avoids committing itself to certain market definitions. At any rate, it reveals a clear tendency to define separate markets for search-based advertising (dominated by Google) and for social media advertising (dominated by Meta via Facebook and Instagram).

Multi-markets approach. All three market definitions that were essential for the designation decisions are based on a multi-markets approach.[58] The Bundeskartellamt defines the intermediation service of the respective platform *vis-à-vis* one (of several) user groups as a separate market. In Facebook and Amazon, however, the competition authority argued, in line with its view, now established for several years, that this is only to be understood as an exceptional case, deviating from a general assumption that a single-market approach may be adequate for defining markets in the case of two-sided (matching) platforms.

Granularity. The Bundeskartellamt defines the relevant products and services offered by the respective digital platform and the associated user groups broadly. For example, in *Amazon*, the authority decided not to follow a more granular approach and to differentiate substitution possibilities depending on the type of product category but to address sellers' substitution possibilities in generic terms. Defining markets at a more granular level would lead to the distinction of markets by product category, which may matter for the subsequent analysis of market power. In the example of Amazon, sellers active in clothing and footwear can use the Zalando marketplace as an alternative. Since Zalando is not active in most other product categories, the assessment of substitutable offers—and, thus, the assessment of Amazon's market power—differs across product categories. Relatedly, in its designation decision about Meta, the Bundeskartellamt did not distinguish between different demographic user groups (however, it does not completely ignore this, e.g. when discussing Snapchat or TikTok).

Methodology. On questions of market definition, the Bundeskartellamt takes account of the findings of other competition authorities, in particular the European Commission, as well as of adjudication in cases involving the respective platforms. The authority bases its own findings about demand substitutability in part on surveys among competitors and other relevant market operators. Further, it emphasizes that "the members of the [chamber deciding the case] who belong to the relevant group of customers can also reach the necessary conclusions themselves on the basis of their own life experience."[59] At some points, the authority's reasoning reads as if demand substitutability was not actually investigated as an empirical phenomenon but rather derived from objectively divergent product features or from divergent business (monetization) strategies. We see here the risk that the Bundeskartellamt is following an easy — but problematic — road, excluding too hastily intermediation services from the market that on closer inspection might turn out effective substitutes (see, for example, the exclusion of vertical search from the general search market or the exclusion of e-commerce activities outside e-commerce marketplaces).

57 Franck & Peitz (2021a, p. 517).

58 The decisions mention at various points that the respective platforms operate on or as "multi-sided markets." This rhetoric stems from unfortunate drafting used by the legislature in section 18(3a) of the Competition Act. Multisidedness is a feature at the firm and not (necessarily) the market level. Therefore, this wording should be understood to mean that the relevant undertaking may qualify as a 19a firm because it operates a multisided platform, acting as an intermediary between different user groups that are linked through cross-group network effects. See Franck & Peitz (2021a, p. 515).

59 Bundeskartellamt, Meta 19a designation decision (n 8) para 145.

A DEFINITION OF PLATFORMS WITH MEANINGFUL POLICY IMPLICATIONS

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I. INTRODUCTION

Although strongly implicated in the 2013 global surveillance revelations by Edward Snowden,[2] popular interest in the potentially harmful role of "tech platforms" arguably truly came to prominence following the 2016 U.S. Presidential election, whereby data obtained from Facebook's advertising platform was instrumental in influencing its outcome.[3] During the COVID-19 pandemic, Alphabet's YouTube, Meta's Facebook and Twitter all came under similar scrutiny for inadequately handling the spread of misinformation, conspiracy theories and anti-vaccination rhetoric,[4] arguably leading to thousands of unnecessary deaths.[5]

Over the last ten years, these and other flash points have led to a surge in inquiries on the role of "tech platforms," including by U.S. legislators which have argued, for instance, that *"today's big tech companies have too much power — too much power over our economy, our society, and our democracy."*[6] Responding to this increased pressure, in 2020 the CEOs of Amazon, Apple, Meta (Facebook) and Alphabet (Google, YouTube) agreed to testify before the Subcommittee on Antitrust, Commercial, and Administrative Law[7] about the nature and influence of their services. Overwhelmingly, the four executives argued the case that their firms were engaged in fierce competition, contrary to the popular (mis)conception that the four firms exert de facto monopoly power in their respective markets.[8]

In academia, discussions over what distinguishes "platforms" from other services in the context of competition and policy have been ongoing in the research literature for nearly twenty years. Central to such discussions is a new market phenomena which fundamentally challenges economists' preconceptions over what misuses of market power entails in the 21st century. This essay takes aim at describing this phenomenon through its past and present interpretations in the literature, with the ultimate goal of arriving at a definition of platforms that is useful for the purposes of policy debates.

II. ORIGINS IN THE RESEARCH LITERATURE

The study of *network goods*, sometimes referred to as "system goods" or "information goods" has for the last forty or so years been a tenant of research in industrial organization. One way of defining such goods is as 'products and services which behave as components in a system or network whose value is significantly enhanced by the presence of other components.'[9] For researchers, such goods are interesting because they differ from 'traditional' goods in that technology decisions are often made by consumers/end-users rather than firms. That is, whereas for traditional goods (such as cars, refrigerators or television sets) firms coordinate — formally and informally — around certain technologies which become standards,[10] for network goods *consumer adoption* is what determines which technologies or *platforms* eventually reign supreme.

A. The Importance of Early Adopters

Because early adopters of new technologies are limited in their ability to predict the future, their decisions as to which new technologies to support are reached largely based on the value of a technology/service at the time of its purchase. That is, an early iPhone buyer was in 2007 paying mainly for the physical and functional attributes of the phone, as they were unable to predict to what degree the phone would become

2 See, for instance, Gellman, B. and L. Poitras (2013). U.S., British intelligence mining data from nine U.S. internet companies in broad secret program. *The Washington Post.*

3 See Kirchgaessner, S., Cambridge Analytica used data from Facebook and Politico to help Trump, *The Guardian*, October 26, 2017.

4 See Alba, D., The surgeon general calls on Big Tech to turn over Covid-19 misinformation data, New York Times, March 3, 2022. https://www.nytimes.com/2022/03/03/technology/surgeon-general-covid-misinformation.html.

5 See Duffy, B. and D. Allington (2020). Covid conspiracies and confusions: the impact on compliance with the UK's lockdown rules and the link with social media use. *The Policy Institute, King's College.*

6 This quote is attributed to senator Elizabeth Warren via her 2020 Presidential campaign website in an article entitled *Break Up Big Tech.*

7 From the 2020 session "Online Platforms and Market Power, Part 6: Examining the Dominance of Amazon, Apple, Facebook and Google" held by the Subcommittee on Antitrust, Commercial, and Administrative Law in the Hearings of the House Committee on the Judiciary. Available at https://www.congress.gov/event/116th-congress/house-event/110883. Accessed on November 7th 2022.

8 See Jarsulic, M. (2020). Using antitrust law to address the market power of platform monopolies. *Center for American Progress.*

9 Definition by Varian, H. R. (2006). *Intermediate Microeconomics–A Modern Approach.*

10 A *standard*, as is well established, defines the technical specifications for a product or service which producers must adhere to in order to ensure compatibility between architectural components (Eisenmann, 2007): Eisenmann, T. R. (2007). *Managing proprietary and shared platforms: A life-cycle view.* Division of Research, Harvard Business School Boston, MA.

a valuable network good (a component in a larger system of applications, accessories, services and so on) later on. That is to say, although such adopters might also have *predicted* that a significant number of other adopters will be attracted in the same way and so expect[11] that their cumulative adoption *might* garner an "ecosystem" of complementary goods and services, strictly speaking this was pure speculation at the time of purchase in 2007.

Whereas early adopters are paying for the good itself plus their expectations about future network benefits, later adopters are paying for the good itself, their expectations about future network benefits plus *present* network benefits which are a function of previous adoption. Early adopters of network goods are in other words at a significant disadvantage to later adopters in the information they possess about a good's ultimate network benefits (and so appropriate price). When their expectations are wrong, they might over-pay for goods whose network benefits in the end turn out to be of limited value. Buyers of Windows phones from 2010-17, for instance, were wrong in their expectations about the future value of the Windows mobile operating system, as the platform was discontinued in 2020. The costs customers encounter when choosing the wrong technology include those related to *opportunity* (missing out on the network benefits of the dominant technology) as well as *switching costs* related to acquiring a new technology (including learning, transferring data, buying new accessories and so on). In many cases, such as for digital services like Uber and Airbnb, the costs of signing up to the wrong service are often limited and strictly related to opportunity (the time spent on signing up and understanding the service). For hardware technologies and technologies which are implemented in large organizations, however, the costs of choosing the wrong system or network can be significant.

B. Network Benefits

The effect that an additional user of a network good or service has on the value of that good or service to others[12] is referred to as a *network externality*. Strictly speaking, network externalities are consumption externalities which can be either *direct* ("same-side") or *indirect* ("cross-side or cross-group"). In cases of positive direct network externalities, the value of a service increases as more users looking for similar functionality choose the same technology/join the same network. Users of the telephone, for instance, benefit as more people buy telephones because they will have more people to call. Indirect network externalities, in turn, arise when a greater number of complementary services ("complements") become available as the network grows. Traditional examples include the increased availability of software for buyers of computer hardware as well as greater availability of customer support or repair services with larger installed bases.[13] More modern examples include the increase in the strength of Uber's value propositions to drivers (earn money from driving passengers) and passengers (convenient ride hailing) with increasing adoption by both groups. We tend to refer to such markets as two- or multi-sided markets, as they consist of multiple, identifiable groups of adopters whose utility from participation are interdependent.

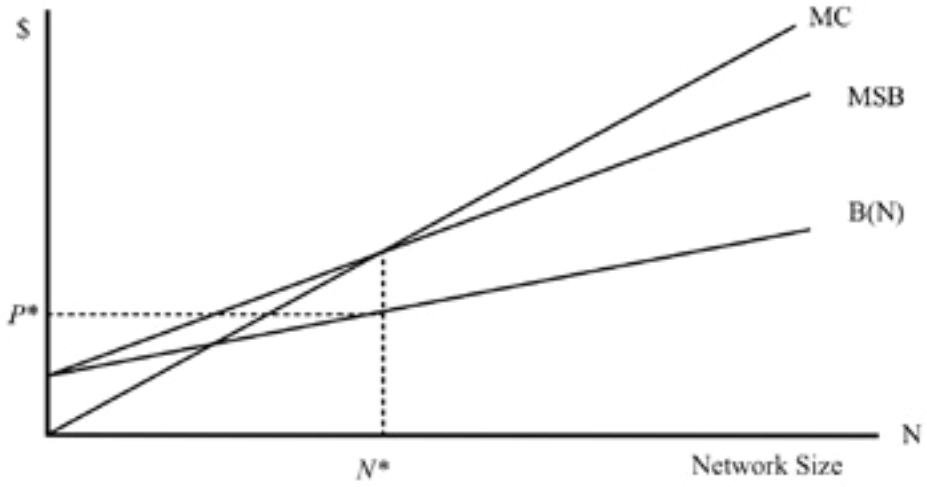

Figure 1: *"The benefit for any individual adopter from participation in a network B(N) relative to the benefit for the network from cumulative adoption MSB and marginal cost of serving additional participants (MC)." From Liebowitz & Margol*is (1994).

To formalize the concept of network externalities, let us consider Liebowitz and Margolis (1994)'s simple model of a network/platform which is

11 See Hagiu (2006)'s work on the role of expectations on two-sided platforms: Hagiu, A. (2006). Pricing and commitment by two-sided platforms. *RAND Journal of Economics 37*(3), 720–737.

12 See Katz & Shapiro (1985) for the first treatise on network externalities. Katz, M. L. & C. Shapiro (1985). Network externalities, competition, and compatibility. *The American Economic Review 75*(3), 424–440.

13 See Katz & Shapiro (1985).

owned by a single firm serving adopters who are all identical, generating direct/same-side network externalities. In Figure 1, B(N) is the benefit that any individual adopter derives from participation in the network, measured in dollars. B(N) is a function of the size of the network N and is a sum consisting of the marginal private benefit and average social benefit. The marginal social benefit ("MSB") from adoption is higher than the benefit to any individual adopter B(N) because MSB includes the positive impact that marginal adoption has on *all other previous adopters.*

The cost of serving additional adopters is also shown ("MC"), and in this figure assumed to be increasing with network size. This is intuitive for certain kinds of networks, such as those which involve physical connectivity between nodes which are further and further away from some initial node/cluster of nodes. Examples include wired telephone networks into rural areas, fiber-optic communication networks and charging stations for electric vehicles. As a function of geographical distance, costs increase the further away from the first node the network extends. An argument can be made for a similar cost curve for certain nonphysical networks, if the majority of costs related to serving additional adopters are for support/customer service. As Liebowitz and Margolis (1994) write, *"It is reasonable to assume that the first [adopters] will be those most suited to use the network, requiring the least support for their participation. [...] the Internet was first used by UNIX wizards, not computer neophytes."*

In one case, where we assume increasing marginal costs related to serving adopters (as in Figure 1), the profit-maximizing behavior for the firm that owns the platform is to charge the price P* and accommodate N* adopters, since this equates marginal revenue (MSB) with marginal costs ("MC"). By assuming increasing marginal costs, we implicitly argue that the network has some optimal size N*. Worth noting here is that marginal revenue includes *both* the price paid by the marginal adopter *and* the effect that the marginal participant has on the willingness of other adopters to pay. An alternative version which would result in the same equilibrium quantities would be to equate the benefit to any adopters from joining the network B(N) with marginal costs (MC), but include in marginal costs decreasing customer acquisition costs as a function of the effect that the marginal participant has on the willingness of other adopters to pay. In this version, network externalities show up as demand-side economies of scale.[14] Technicalities set aside, when marginal costs increase with adoption (the line MC points upwards), the optimal size of the network to the owner is finite, and in the competitive case (more than one platform competing for adopters), indeed even a perfectly competitive market.

In cases apart from those described above (physical networks and networks whose costs are primarily related to customer support), it is prudent to question the assumption that marginal costs increase with participation. Take a social network such as Facebook as an example. A communications network at heart, Facebook's value to adopters is (or at the very least, was) strongly positively correlated with the number of other adopters with whom one might interact. The costs related to serving users are infinitesimal at scale (related to bandwidth, data storage and support). One might even argue that support costs could decrease with scale due to peers supporting one another and there being increased availability of support through third-party sites which help users through how-to videos, guides and support forums.[15] In such cases, even if marginal costs are assumed to be constant (the line MC in Figure 1 is horizontal), the model turns into one of natural monopoly where, ceteris *paribus*, the optimal size of the network (in terms of providing value to participants) is infinite (or the entire population).[16] Here, naturally, we begin to approach territory which will be of interest to political leaders and policy makers.

C. Pricing and Market Power

It is quite a testament to Facebook's achievement that the company has managed to grow their network to an estimated 39.8 percent of the global population.[17] Although far from infinite, a network of more than 3.1 billion people certainly constitutes a considerable barrier-to entry for potential competitors looking to establish a similar offering. However, although Facebook's users number in the billions, this figure is actually of limited value in attempting to discern to what degree the firm is dominant in its industry. This is a key point, and one that is often overlooked, especially by journalists and pundits.

In order to understand market power in two- or multi-sided markets it is helpful to first consider the stereotypical example of a multi-product pricing scheme such as that first employed by Gillette in the commercialization of disposable razor blades.[18] The now well-known

14 A term coined in Katz, M. L. & C. Shapiro (1986). Technology adoption in the presence of network externalities. *Journal of Political Economy 94*(4), 822–841.

15 Consider for instance the value of how-to videos on YouTube and articles on WikiHow, as well as support forums such as Quora and Stack Exchange.

16 For a more thorough discussion of this case, see Liebowitz, S. J. & S. E. Margolis (1994). Network externality: An uncommon tragedy. *Journal of Economic Perspectives 8*(2), 133–150.

17 Estimates of Facebook user numbers vary and fluctuate, but according to Statista as of 2022 the estimated percentage of the worldwide population with a Facebook account was 39.8 percent. Available at https://www.statista.com/statistics/241552/share-of-global-population-using-facebook-by-region/.

18 Analogy first employed by Rochet and Tirole (2003): Rochet, J.-C. & J. Tirole (2003). Platform competition in two-sided markets. *Journal of the European Economic Association 1*(4), 990–1029.

pricing scheme works as follows: First, sell a razor at a low price (at or even below marginal cost) such that as many people as possible are able to buy one. Next, sell razor blades to the same buyers at a price well above marginal cost. Because the razor blades are non-durable/consumable and the buyer now has a sunk cost in the razor, over time the profits from the sale of razor blades will far exceed the potential profits from the sale of a "traditional" razor with a fixed blade. Subsidize sales of one good in the present in order to maximize sales of a complementary non-durable good in the future — or as King C. Gillette put it: "Give em the razor, sell em the blade!" Today, the model is ubiquitous.

Although Cournot observed that discounting the price of zinc sells more copper in the brass market as early as in 1838,[19] the development of comprehensive formal models capturing the economics of multi-product pricing strategies first occurred in the 1970s and early 80s.[20] A key insight is that unlike for simpler products, *"a multi-product firm must decide about the structure of its relative prices as well as its overall price level."*[21] Firms must thus identify multiple optimal prices (for both the razor and the razor blade) in order to produce optimal quantities. And so, although (when viewed in isolation) the price of the razor below marginal cost might be suspicious, when viewed as one component in a multi-component system, its subsidized price is perfectly in line with the expected behavior of a profit-maximizing firm.

The key to understanding how platforms are different from traditionally, vertically integrated firms (or resellers) is to understand this distinction. Market power in two- and multi-sided markets with network externalities cannot be assessed by only looking at one "component" such as Facebook's market share or the profit margin of Apple's App Store. The system or network *as a whole* is the proper unit of analysis.

III. A NASCENT THEORY OF PLATFORMS

> *"The starting point for the theory of two-sided markets [...] is that an end-user does not internalize the welfare impact of his use of the platform on other end-users."* — Rochet and Tirole (2006)

It was Rochet and Tirole (2003) who twenty years ago first observed that subsidization across two- or multi-sided markets formally bares close resemblance to subsidization across components in multi-product systems such as Gillette's razor and razor blades scheme. In both cases firms need to identify not only an optimal price *level*, but also an optimal price structure in order to determine equilibrium quantities. Their paper, first published in *Journal of the European Economic Association* entitled 'Platform Competition in Two-Sided Markets' identifies platforms as very distinctive businesses *"characterized by the presence of two distinct sides whose ultimate benefit stems from interacting through a common platform."*[22] A main contribution of the paper is its demonstration of what sets such businesses apart from the single-sided businesses that had been treated in the "traditional" economic literature up until this point.

The Monopoly Case. Rochet & Tirole's analysis centers around a two-sided platform such as e.g. a payment system where both consumers (buyers) and merchants (sellers) are better off if they coordinate and use a single platform such as VISA or MasterCard. The main value proposition of such a platform might be described as "the facilitation of transactions between buyers and sellers." A monopoly platform charging users per transaction is looking to maximize transaction volume, but its profits are affected by the mix of buyers and sellers *as well as* the total level of participation. Similar to how Gillette needs to consider the optimal quantities of both razors and razor blades in order to maximize profits, the platform needs to optimize participation levels among both buyers and sellers in order to maximize the value of belonging to the network. Network effects, thus, dictate prices, as this is the main mechanism the firm has for regulating participation. Only if both groups' demand functions are identical should both sides pay the same for access to the network, as this is the only point at which equal participation is the optimal mix of buyers and sellers (in terms of maximizing the transaction volume on the platform).[23] Price discrimination is thus a key strategic instrument in establishing platforms in two- and multi-sided markets.

A related, similar analysis of platforms where adopters pay based on *participation* (rather than usage) was published a few years after

19 Anecdote from Parker and Van Alstyne (2005): Parker, G. G. & M. W. Van Alstyne (2005). Two-sided network effects: A theory of information product design. *Management Science 51*(10), 1494–1504.

20 The literature generally credits Baumol, P. & J. Panzar (1982). Contestable markets and the theory of industry structure. *New York* and Bailey, E. E. & A. F. Friedlaender (1982). Market structure and multiproduct industries. *Journal of economic literature 20*(3), 1024–1048.

21 See Armstrong, M. & J. Vickers (2018). Multiproduct pricing made simple. *Journal of Political Economy 126*(4), 1444–1471.

22 See Schmalensee (2014) for a thorough review of Rochet & Tirole's paper and its impact. Schmalensee, R. (2014). An instant classic: Rochet & Tirole, platform competition in two-sided markets. Competition Policy International 10, 173–175.

23 *Ibid.*

Rochet & Tirole's influential paper.[24] Similarly as in the per-transaction case, profit-maximizing prices on such platforms indeed depend on network effects and so may both be below marginal cost (of participation) as well as highly skewed towards one group. In both cases, most if not all of a platform's profits may be earned from only one group of adopters, and policy makers should have no issue with the credibility of this outcome. A profit-maximizing platform is simply aiming to stimulate the optimal levels of participation such that all adopters are deriving as much value as possible from participation in the network. Thus, in assessing market power, the conclusion must be that price on one side of a two- or multi-sided market alone, even in the monopoly case, is essentially uninformative to any sound welfare analysis.

The Competitive Case. In cases where platforms are competing over adopters on one or several sides of a two- or multi-sided market, in addition to network effects, optimal prices hinge on the properties of the firm's value proposition and whether or not it is convenient and useful for adopters to belong to one or more platform(s) simultaneously. The best example of the latter is arguably Rochet & Tirole's example of the market for card payments, as both consumers and merchants can here comfortably utilize several platforms simultaneously. An additional card in a buyer's wallet isn't much of an inconvenience, but might be useful in cases where one service is experiencing an outage. Merchants similarly are not greatly inconvenienced by supporting multiple payment platforms, as payment terminals these days are generally supplied through third-party services which add support for the largest payment platforms in accordance with the demand among merchants for such functionality. Referred to as "multi-homing" in the literature, such symmetric cases are useful in demonstrating how competition among firms in two-sided markets with network effects is indeed often similar to competition in traditional markets.

The picture changes in cases where there is an asymmetry in multi-homing such that one side of a two- or multi-sided market is best served by belonging to a single platform rather than multiple. Such cases are arguably where policy makers' attention is most warranted, as single-homing on one side is conducive to higher degrees of market power for incumbent platforms. The best example of such a market is perhaps that of smartphone operating systems, where developers of applications and games typically multi-home (develop for both iOS and Android) in order to reach the entire market of smartphone users. Users, however, generally only belong to either iOS *or* Android, as carrying two phones simultaneously is inconvenient and expensive. In such cases, which arise as a function of the particular two-sided value proposition of the platform, "competitive bottlenecks"[25] can occur where there is intense price competition for users on the side of the market where multi-homing is inconvenient. The outcome, at least in theory, is a price level which is more favorable for participants — as competing platforms will drive down prices. Regardless of outcome, the potential for such a "natural duopoly" arises *due to the nature of the value proposition of smartphone operating systems* rather than e.g. predatory pricing strategies or other forms of anti-competitive behavior.

The Illustrative Case of Google and Facebook. Google's apparent dominance in the web search market is a much-cited example of platform dominance in the popular debate. Estimated to process as much as 92 percent of all internet searches worldwide in 2022, from the outset, such scrutiny indeed seems warranted.[26] However, as Google's price to consumers for search is (and always has been) zero, using traditional methods it is difficult to discern exactly where the company's dominance leads to sub-optimal consumer welfare *on that side of the market*. Users are of course free to instead choose competing services, and *ceteris peribus*, competing firms are free to offer a similar service at the same or even a lower price point.[27] Neither of the main technologies at the heart of Google Search rely on unknown technologies, network effects or intellectual properties. Any company can build web crawlers to index websites to a database and offer a simple front-end user interface. Google does so supremely well at a remarkable scale, but with sufficient funding any new start-up company could arguably do the same. Baidu, for instance, dominates China's search market with an estimated 76.5 percent market share in 2022.

Of course, Google isn't a nonprofit organization. The millions of searches through their search engine are valuable, despite being priced at zero. However, rather than being an example of predatory pricing (where users' prices will be higher in the long term as a result of artificially low prices in the short term), like Gillette and the examples used in Rochet & Tirole's paper, rather than monetize search, in order to maximize profits Google chooses to fully subsidize this part of its value proposition. This because doing so generates higher expected profits for a related value proposition: advertising. Maximizing participation of searchers — like maximizing the sale of razors — maximizes the value of access to Google's system to advertisers. Advertisers will pay to gain access to searchers just as developers will pay to gain access to smartphone users.[28] Conveniently for this example, Google's parent company Alphabet is a competitor in both of these markets.

24 See Armstrong (2006).

25 Term first coined in Hagiu (2006), elaborated upon in Armstrong and Wright (2007). See Armstrong, M. & J. Wright (2007). Two-sided markets, competitive bottlenecks and exclusive contracts. *Economic Theory 32*(2), 353–380.

26 Estimate according to StatCounter. Available at https://gs.statcounter.com/search-engine-marketsharemonthly-202011-202211.

27 Negative pricing strategies include the use of as coupons and discounts in order to stimulate adoption

28 Famously, developers for the iOS App Store and Google Play Store pay a fee of 15-30 percent of all revenue for access to users via these platforms

Inconveniently, however, the properties of both markets are such that multi-homing can and does occur, leading to fierce competition with other platforms and services for the revenue-generating part of Alphabet's value propositions. Whereas searchers tend to favor one search engine, advertisers are unscrupulous in their preferences for buying advertising from multiple vendors simultaneously, aiming to maximize the exposure of their ads in various different contexts. Similarly, although consumers tend to only carry one smartphone in their pocket, developers of apps and games will utilize cross-platform architectures, frameworks and libraries such that their software can easily be made available to consumers regardless of which smartphone they choose to buy. Thus, although Google in 2022 enjoys a market share of 92 percent in web searches (the subsidized side of its two-sided market), its market share for digital advertising (the profit-making side) was 28.6 percent in 2021. Facebook's share of the same market was 23.7 percent, Alibaba 8.6 percent, Amazon 5.8 percent, Tencent 2.9 percent and others 30.4 percent.[29]

Hardly a monopoly.

IV. DISTINGUISHING PLATFORMS FROM OTHER SERVICES

Following the first papers of Rochet & Tirole (2003), Armstrong (2006) and Caillaud & Jullien (2003), a stream of papers modeling platform competition, pricing, expectations, entry, openness and governance strategies emerged, the majority of which from researchers within industrial organization, strategic management and technology management traditions.[30] Depending on the topic of such papers, various platform definitions also emerged, each of which emphasizes different attributes, such as *"products and services that bring together groups of users in two-sided networks," "platforms coordinate the demands of distinct groups of customers who need each other in some way,"*[31] *"markets involving two groups of agents interacting via platforms where one group's benefit from joining a platform depends on the size of the other group that joins the platform"*[32] *and "platforms enable interactions between end-users and try to get the two (or multiple) sides 'on board' by appropriately charging each side."*[33] The perhaps most widely adopted (and broad) attributes of what constitutes a platform are those described in Hagiu & Wright (2015), which describe platforms as: 1. Enabling direct interactions between two or more distinct sides; where 2. Each side is affiliated with the platform.[34]

The definition most closely aligned with the attributes highlighted in this article is perhaps that provided by Evans et al. (2006), who described *"businesses in which pricing and other strategies are strongly affected by the indirect network effects between the two sides of the platform."*[35] This definition captures the key ingredient that pricing in two- and multisided markets is a function of network effects, however omitting the fact that pricing is also a function of competition, which in turn is a function of the attributes of a platform's value proposition. As we have seen, whether or not a high degree of market concentration occurs on one side of a two- or multi-sided market is mainly a function of the attributes of the value proposition(s) of the platform (e.g. users will only carry one phone), not network effects. Thus, we arrive at an augmented, elaborated form of Evans et al. (2006)'s definition, articulated specifically for policy debates:

Definition: *"Platforms exploit value propositions which benefit from demand-side economies of scale by subsidizing across customer groups in accordance with customers' willingness to pay and the nature of the platform's value proposition."*

This definition aims to capture the key properties that distinguish platforms from other services, namely that 1. The strength of a platform's value proposition is a function of its number, quality and composition of adopters, 2. Subsidization is a strategic instrument employed to optimize the number, quality and composition of adopters and 3. The degree of competition among platforms for adopters hinges on the nature of their value proposition(s).

29 Estimates according to Statista. Available at https://www.statista.com/statistics/290629/digital-adrevenue-share-of-major-ad-selling-companies-worldwide/.

30 See a complete review in McIntyre, D. P. & A. Srinivasan (2017). Networks, platforms, and strategy: Emerging views and next steps. Strategic Management Journal 38(1), 141–160.

31 Definition from Evans, D. S. (2003). Some empirical aspects of multi-sided platform industries. *Review of Network Economics 2*(3).

32 Definition from Armstrong, M. (2006). Competition in two-sided markets. *RAND Journal of Economics 37*(3), 668–691.

33 Definition from Rochet, J.-C. & J. Tirole (2006). Two-sided markets: A progress report. *RAND Journal of Economics 37*(3), 645–667.

34 Hagiu & Wright (2015) clearly set out to define platforms in the broadest sense possible. The downside is that the vagueness of the definition leaves it open to interpretation and potential misappropriation, as well as making it less applicable outside of academia. See Hagiu, A. & J. Wright (2015). Multi-sided platforms. *International Journal of Industrial Organization 43*, 162–174.

35 Evans, D. S., A. Hagiu, & R. Schmalensee (2006). Invisible engines: How Software Platforms Drive Innovation and Transform Industries. The MIT Press.

V. CONCLUSION

Although research on platforms in two- and multi-sided markets has come a long way in the last twenty years, the field has arguably only begun scratching the surface of important topics related to competition and policy. Among the main issues currently garnering researchers' attention is the question of how to conceptualize and surmise consumer welfare for interconnected, multi-component, multi-sided value propositions such as those offered by companies like Facebook, Apple, Amazon, and Alphabet.

As this article has argued, singling in on isolated value propositions such as e.g. that of Google Search for users is unlikely to lead to meaningful findings in terms of establishing anti-competitive practices. Conversely, looking at price as the single, key determining variable in welfare analyses is also unlikely to capture the essence of consumers' state of well-being in two- and multi-sided markets. Indeed, what perhaps is most needed are new ideas which re-conceptualize the "traditional" notions of consumer welfare beyond the current, limited models of estimated allocative efficiency. Such holistic models should include an emphasis on lock-in mechanisms and switching barriers, complexity and sunk costs — to name a few.

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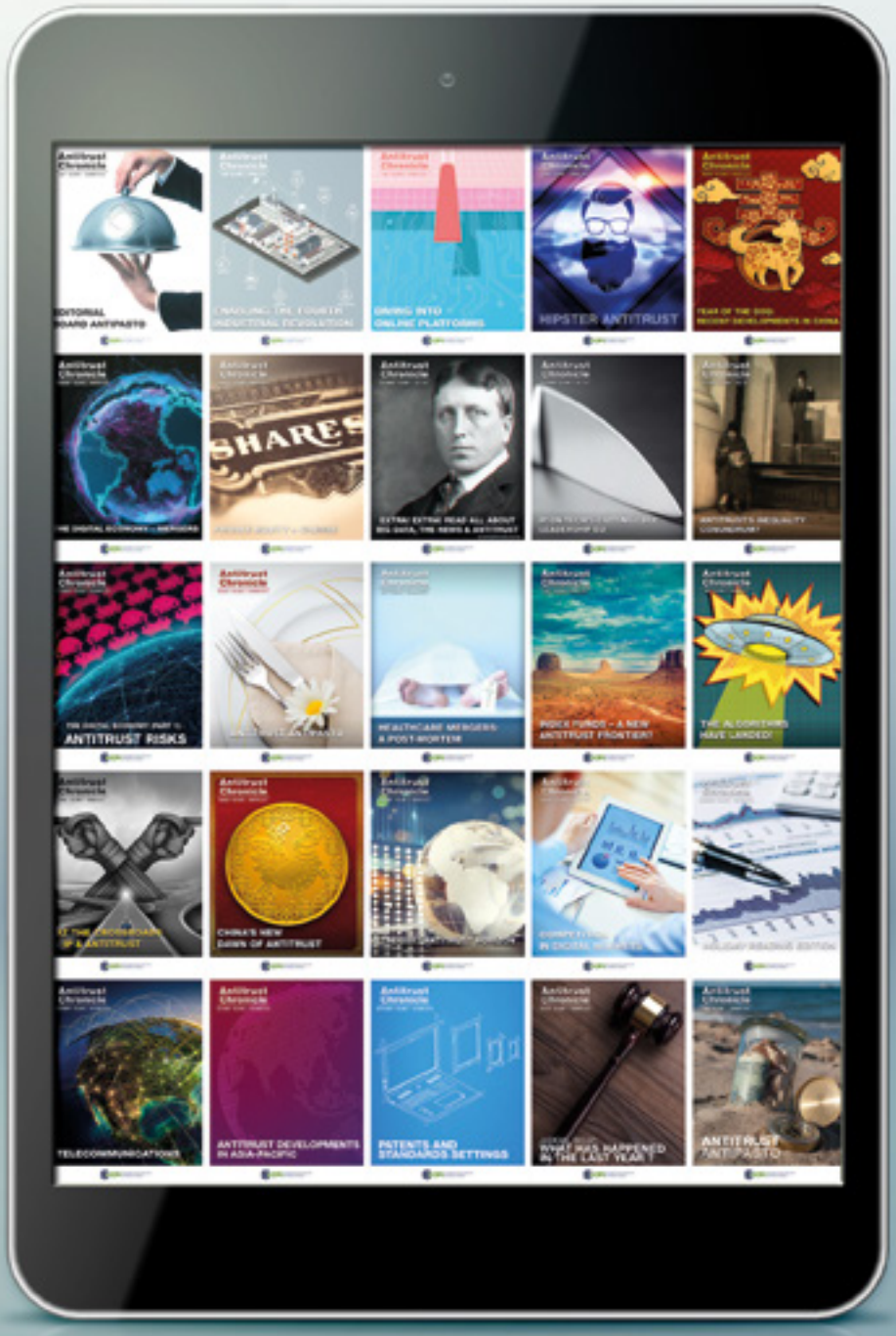


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